

AN
E S S A Y
ON THE
NATURE, CAUSES, and CURE
OF THE
CONTAGIOUS DISTEMPER
AMONG THE
H O R N E D C A T T L E
in these KINGDOMS.

By DANIEL PETER LAYARD, M.D.

Physician to her Royal Highness the Princess Dowager of
WALES; Member of the Royal College of Physicians in
LONDON, and of the Royal Societies of LONDON and
GOTTINGEN.

Da facilem cursum atque audacibus annue ceptis:

Ignarosque viæ mecum miseratus angustes

Ingrederere; ac votis jam nunc assuesce vocari.

VIRG. Georg. lib. i. ver. 40.

The THIRD EDITION.

To which is added, A Discourse on the Usefulness of Ino-
culation of the Horned Cattle.

In a Letter to the late Right Honourable GEORGE Earl of
MACCLESFIELD, P. R. S. from Dr. LAYARD.

L O N D O N :

Printed for J. and F. RIVINGTON, in St. Paul's Church-
yard; THOMAS PAYNE, at the Mews-gate; JAMES
ROBSON, in New Bond-street; and JOHN WALTER, at
Charing Cross.

M.DCC.LXX.

E S S A Y

ON THE

NATURE, CAUSE, AND CURE



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MDCCLXXX.

To the Right Honourable

JOHN Earl GRANVILLE,
Lord President of His Majesty's Most
Honourable Privy Council.

MY LORD,

YOU are so justly intitled to
the first tender of an Essay
of this sort, from the high place
you fill in his Majesty's most
honourable Privy Council, that
whatever presumption there may
appear to be, in making it with-
out your Lordship's express per-
mission, I may flatter myself, I
cannot easily be censured for the
impropriety of this address. Be-
sides, my Lord, I look upon it
as a debt, not less due to the
particular turn of mind you are
possessed of, than the station

A 2

you

iv DEDICATION.

you are placed in: and I feel the greater satisfaction in discharging it, as my views therein are of the most public and disinterested nature.

The subject has not been thought unworthy of the royal attention, the consideration of the Privy Council, nor the deliberation of the Parliament itself. Orders, laws, and rewards, have been repeatedly made, enacted, and distributed, from time to time, for the preservation of the cattle, and consequently the support of the people. To whom, therefore, could I more properly have submitted this Essay than to your Lordship, who, in the most distinguished manner, eminently preside over his
Ma,

DEDICATION. v

Majesty's most honourable Privy Council, have assisted at all the deliberations on this subject, and doubtless had no small share in the direction of those wise regulations issued on the occasion.

The ROMANS deservedly applauded, and transmitted to posterity, the shining virtues of their senators.—The annals of BRITAIN, in justice to our's, will record to future ages the excellent qualities which adorned them.

CATO could quit the ROMAN senate, and in his country-retirement amuse himself with agriculture and husbandry.—And you, my Lord, when the more important business of your station will permit, can forgo the delights of a scene in which you can't but

vi DEDICATION.

reap applause, for the calmer recreations of solitude. It is here, in truth, that we view creation, if not in the fullest, at least in the steadiest light; and whatever the munificence of heaven exhibits, as its different scenes are shifted, your Lordship is at all times qualified, from the happiest disposition of mind, at once to relish its beauties and discern its worth.

CATO'S rules were designed for the advantage of the ROMANS.—You, my Lord, would secure plenty and happiness to the ENGLISH. I am, with the greatest Deference and Respect,

My LORD,

Your Lordship's most humble
and most obedient Servant,

Huntingdon,
Jan. 31, 1757.

DANIEL PETER LAYARD.



THE
P R E F A C E.

WHEN the distemper among the horned cattle first broke out in *London*, in the year 1744, I lived at too great a distance from any herds to get knowledge of it, either by observing the course of the disease, or inspecting the dead carcases. The various and contradictory accounts published, the medicines prescribed by different gentlemen, with intentions visibly opposite, made me believe one side must be mistaken, and that those gentlemen had not all the advantages for observation, nor clear informations, requisite to fix their opinion.

viii P R E F A C E.

nion. Fully persuaded of this, I thought no more about it; till in FEBRUARY last, 1756, the distemper broke out in a neighbouring town, called GODMANCHESTER, wherein are two considerable herds of cattle. Hearing the distress of some of my neighbours, and that, unwilling to kill their beasts, they took their chance as to the disease; I begged leave, for my own satisfaction, to see some carcasses opened immediately after death.

A considerable farmer granted my request, and I saw four opened, of which I give an account in the chapter on dissections. By examining the farmer, and his servants, I obtained a rational description from them, in what manner the cattle seemed first affected, what they observed in the course of the illness, and the event. The farmer assured me, that this disease was at this time exactly the same with that which visited the whole town ten years before, and that whatever they tried
I A had

had no effect ; few recovered by medicine, or without : but he observed in general, that such as were bled much or purged, never recovered. For want of proper authors on the subject, I, having none by me, took some little time to fix my notions of practice, by means of the observations I had made on the distempered cattle, a comparative view of morbid carcases, and of sound ones in the slaughter-house ; and likewise by the analogy there appeared to be between putrid fevers in the human body, and this epidemical contagion among the cattle.

How far I succeeded in my attempt, and what were the consequences of my directions, is well known in the neighbourhood.

Mr. M---- had lost already ten head of cattle, two more were dying, and seven others ill, when I first took upon me the direction of the *seven* which were last fallen ill. Of these *five* recovered : one cow, very near her time
of

I P R E F A C E.

of calving, died; and the *seventh* was certainly lost, for want of observing the due time of the *crisis*, and her purging too soon. * But the loss of this cow may prove the saving of thousands; for, by this single failure, I was convinced, how regular this distemper is in its course. Some calves were afterwards treated in the like manner, and did well.

Thus far I went on, without the least assistance or advice, either from authors or practitioners: I now grew desirous of reading, what I could collect written on this subject. VIRGIL, in his *Georgics*, had hitherto been the only evidence I could produce, of such a distemper breaking out in ITALY. RAMMAZINI and LANCISI have since confirmed the same. From the year 1744 to the end of 1753, the *Gentleman's Magazine* affords various accounts from different hands, and abounds with numberless receipts;

* See the chapter of Observations.

whe-

whether well or ill adapted, let the success of them determine. Indeed, where timely and properly given, I believe, several may have proved efficacious; while others could at no time, nor in any shape, prove useful. Yet the authors of them all are undoubtedly praise-worthy, for their generous endeavours towards promoting the public good.

CATO, VARRO, and COLUMELLA, who all wrote *De re Rustica*, seem by their directions, both as to the care and cure of the horned cattle when ill, to have been well acquainted with their distempers. The remedies they have transmitted to posterity, are not to be despised.

I cannot learn that, to this day, any one has published a distinct and regular account of this dreadful calamity; since, therefore, abler hands, through want of opportunity, or being better and more usefully employed, for the benefit of society, have been hindered from

from executing this task, tho' very little desirous of becoming an author, yet I should think myself highly culpable in with-holding such observations as might turn to the advantage of the present community, or furnish posterity with hints to improve upon.

This essay consists of my own observations, strengthened by the opinions of ancient and modern writers. It is divided into chapters, for the sake of perspicuity.

The Introduction points out the reasons why a regular method of treating this contagious distemper has not been observed, and the motives which induced me to investigate the progress of the sickness, and endeavour at fixing a rational method of cure.

The first chapter, from the authority of ancient and modern history, traces the origin of this disease, attempts to prove the contagious quality, and in what manner it was brought
over

P R E F A C E. xiii

over to us, and propagated in the BRITISH dominions, shewing the analogy it bears to the small-pox.

The second chapter treats of the symptoms. And here it is much against my will, that I am obliged to contradict Dr. BROCKLESBY, who, in his essay on the mortality of the cattle, p. 32, printed in 1746, says, that *all that had not the looseness before the third day died*. As this gentleman is the only author, or observer, that found the scowering a favourable symptom, while all others were and are convinced it is the most fatal that could befall the cattle; I must presume, that either the Doctor visited cattle ill of some other distemper, or, if his opinion was grounded upon the relation of others, that he was greatly imposed upon. Dr. MORTIMER positively declares, that the few among the cattle which have recovered, did not purge, or but little *. LANCISI, the

* See Gent. Magaz. vol. xvi. p. 652, containing Dr. MORTIMER's account read before the royal society, Dec. 21, 1745.

most

xiv P R E F A C E.

most accurate author on this distemper, openly declares against purging ‡. Experience has sufficiently proved, that these authors were not mistaken.

The third chapter indicates, first, what sort or colour, age and sex, among the cattle, are the strongest or weakest; and, of course, more or less exposed to the ill effects of the contagious distemper. Secondly, the season in which this disease spreads most. Thirdly, the signs whereby a recovery and favourable issue may be expected. And lastly, such signs as plainly foretell the death of the beast.

The fourth chapter contains an anatomical inquiry into the particular structure of the horned cattle, gives a comparative view of both the sound and morbid state the cattle are found in; and from the examination of the carcases, especially of the admirable formation of the several stomachs, the first impression of the contagious ef-

‡ LANCISI de bovillâ peste, part. iii. p. 156.

fluvia,

P R E F A C E. xv

fluxia, the progress and effects of the disease are traced; and reasons are assigned for the inutility, inefficacy, and danger, attending the administration of vomits and rough purges.

The fifth chapter shews the chief methods of cure, which have been recommended, and have failed of success, with remarks on such medicines or operations directed, and why they must have been improper in most cases, and frequently detrimental. Then is subjoined the method of cure, which was attended with the most favourable consequences, and proved effectual, in saving the lives of those beasts on whom it was regularly practised. Directions are laid down for the management of the cattle, from the first infection; the medicines to be administered are put down in the plainest, cheapest, and easiest manner, adapted both to the comprehension and purse of every grazier and farmer. But should any farther explanation or

directo-

direction be necessary, I make no doubt, that their humane and charitable apothecary, of whom they buy their drugs, will kindly lend his assistance, by giving his neighbours the best information he is able. Besides the remedies, proper in the whole course of the distemper, such are also directed, and a method recommended, for the cure of such disorders, as frequently succeed the disease, especially when it has been ill managed.

In warmer climates, as ITALY and FRANCE, the medicines have been given, and are directed to be mixed up with wine; but considering the difference of climate, that in our's there is less perspiration than in those southern parts, and that small ale will answer all the purposes for our horned cattle, that their weak wine is calculated for;--I have preferred what was more natural, at hand, and cheapest for my countrymen to buy for their beasts. Tho' the acid of verjuice, either from grapes or crab-apples, may
be

P R E F A C E. xvii

be good and useful, particularly in the first stage, or inflammatory state of the disease; yet as I did not make use of it, but kept intirely to the use of white wine-vinegar, without discommending the verjuice, I have only recommended the vinegar.

The sixth chapter includes observations made on all the cattle I attended, with an account of the success, whether good or bad, that resulted from the manner of treating those distempered beasts. Some notice is also taken of the pernicious effects of *opium*, or any of its preparations, in putrid fevers of all sorts.

I shall here add an account of the cattle which died, or were recovered, as I received it from my neighbour Mr. M----.

a

Died

xviii P R E F A C E.

Died before I visited the cattle,	10
Dying when I went there,	2
Of the first seven I directed for, } died - - - - -	2
One brindled cow with calf, died,	1
One calf, who took no other me- } dicine but GODFREY'S Cordial, }	1
	16

Recovered of the first seven I di- } rected for, as mentioned in the } chapter of Observations, - - - }	5
Two which slipt their calves after } the above, - - - - - }	2
One bull, - - - - -	1
One black cow, - - - - -	1
Yearling calves - - - - -	6
	15

N. B. The bull was but slightly infected, and required little attendance.

The seventh chapter, after relating in a cursory manner the great advantages

P R E F A C E. xix

tages of inoculation in general, points out the time proper to perform it, a method of preparation, the place and manner of performing the operation, together with the management to be observed.

I wish, in recommendation of this beneficial practice, I could add some observations of my own, made on the cattle; not but the authority of the worthy persons mentioned in this chapter, is proof sufficient to confirm the great use of inoculation; yet it would have given me pleasure to have added to such testimony; but opportunity has not offered, for my seeing any cattle inoculated. From the authority of others, and my own experience, what benefit inoculation is of to mankind, I think it by no means a practice to be neglected, in the case of the contagious distemper among the cattle.

The eighth and last chapter is designed to prevent the admission and

spreading of this dreadful distemper in the BRITISH islands, in which, thank God, it is considerably abated; and only breaks out now and then in such places, where, for want of proper cleansing after the infection, or carelessness in burying the carcasses, the putrid *fomes* is still preserved, and is ready, at a proper constitution of the air, or upon being uncovered, to disperse such a quantity of *effluvia*, that all the cattle, which have not had it, will be liable to infection.

Care and time may extirpate the disease; at least, such devastation as has happened of late years may be prevented. But, of all cautions, prohibiting the importation of infected cattle and hides is of the greatest importance; since, for want of due attention, this distemper may repeatedly be introduced.

I would not, in the course of this chapter, be understood as contradicting and disobeying the laws of the realm,

P R E F A C E. xxi

realm, by encouraging the care and treatment of distempered cattle, instead of killing them the instant they were taken ill; nor by preferring the burying of the carcasses without cutting or flasing the hides. It is the happiness of an ENGLISHMAN, under the best constitution and government, that he may offer his reasons for the public good, tho' different from the rules established, provided his sentiments are delivered with deference and respect. I would, therefore, avoid giving any offence; and, I flatter myself, none can be taken, if such methods be pointed out, which tend to the preservation instead of the destruction of the cattle; and to confine the putrid matter, instead of letting it loose to spread the infection.

Neither a vain parade of learning, nor an ostentatious show of reading, have drawn from me the several quotations interspersed in this essay. Vouchers were necessary to corroborate

rate what I assert, and I chose to give the author's own words, and pay a due regard to every learned author whose assistance I am beholden to.

All I mean by this attempt, is to be useful to my countrymen; if I should be mistaken in any thing I have advanced, I am ready to retract, and change my opinion for one of greater use. I only desire Mr. POPE's rule may be observed:

*In every work regard the writer's end,
Not free from faults, nor yet too vain
to mend.*

Essay on Criticism.

And should this imperfect performance, for want of a better, prove recommendable to society by the hints I have given, I shall always reflect with great pleasure, that I have endeavoured to contribute my mite towards the benefit of mankind.



T H E

CONTENTS.

The Introduction, Page 1

CHAP. I.

*Of the origin, nature, and causes of
the contagious distemper,* 9

CHAP. II.

Of the diagnostics, or symptoms, 24

CHAP. III.

Of the prognostics, 27

CHAP. IV.

Of the dissections, 36

CHAP.

CONTENTS.

CHAP. V.

Of the method of cure, 60

CHAP. VI.

Observations, 86

CHAP. VII.

Of inoculation, 100

CHAP. VIII.

Of the means to prevent the infection, 111



INTRO-

INTRODUCTION.



O discover and account for the nature of the distemper among the horned cattle, after it has raged so many years in different parts of EUROPE, and moreover to ascertain a method of cure, appears at this time as difficult and unpromising a task, as it was of old to untie the gordian knot. Yet the opinions and directions of those learned physicians * RAMMAZINI and LANCISI, published in 1711 and 1715, the observations of other physicians of a still later date †, with those of other persons, all afford us some ground to expect, that this distemper may be traced through its several stages; consequently, that a rational account of its nature, progress, and means of cure, may also be given, together with proper cautions to avoid the spreading of this dreadful calamity: authorities sufficient, I hope, to clear this essay from the least imputation of presumption.

* Sed omnium phaenomenorum exactam rationem adferre velle, non patitur unius horae ambitus: ampla enim materia suppeteret ad integrum tractatum conscribendum. RAMMAZINI De Contagiosa Boum Epidemia, p. 458.

† Lond. Mag. 1745, p. 568 and 598.

B

Indeed,

2 INTRODUCTION.

Indeed, if the many obstacles that have occurred were calmly considered, every one would be amazed even at the small benefit which society has received from the different and repeated investigations of physicians, and the observations also of others; the public may well wonder at seeing such numerous herds of cattle brought to market, when no fixed method of cure has yet been recommended by sufficient success, so as to have it generally followed. For the increase of our herds, and their healthy state, we therefore are solely indebted to all-bountiful Providence, without the least, nay, even prudential, care from our farmers and graziers. But, yet, these are not altogether to be blamed. No sooner did this distemper make its appearance, than the legislature, alarmed, gave the wisest and most salutary orders and regulations, for preventing its spreading: physicians were directed to give their opinions and directions, after due inspection of the carcases, examination of the sick, and receiving such accounts and relations as the farmers, cowkeepers, &c. could furnish them with.

What was the consequence of this well-intended inquiry? The farmers and graziers reasonably expected a satisfactory description of the disease, and a cheap method of cure*;

* *Neque enim credant posse eum scire quomodo morbos curare conueniat, qui unde hi sint, ignoret. CELSUS in Prefatione.*

but



INTRODUCTION. 3

but finding themselves disappointed in what they had promised themselves, with regard to the former, they paid little attention to what was offered with a view to the latter. In both, the physicians did not agree. Without raking up the ashes of the dead, to point out their *foibles* while living, I shall be content with saying, that some affirmed the disease to be an inflammatory fever, without the least infectious quality †: some, that it was a peripneumony; others, a bilious fever, arising from obstructions in the liver and gall-bladder: while those who were more conveniently situated, had perhaps more leisure, or gave themselves time to reflect before they set forth their observations, and then wrote nothing but what they saw; these ‡ physicians, and others, gave solid reasons for their directions; they were frequently successful. The farmers tried their method; but it did not always succeed. Bleeding, purging, bark, &c. tho' all good, when properly and in due time administered, became destructive or useless in another stage of the disease. Disappointed thus far in their hopes, from regular practitioners in physic; no doubt because, thro' ignorance or inattention, the farmers had not furnished those gentlemen with sufficient and constant relations of the symptoms; they despised all

† See Gent. Mag. vol. xvi. p. 649 and 686.—vol. xvii. p. 30.

‡ See London Mag. for Nov. 1745, p. 568 and 598.

4 INTRODUCTION.

regular methods, and run headlong after such remedies as, at once, were to remove every complaint, and were honoured by the authors with the ever recommending title of *Infallible*. Nor were these remedies more efficacious. * Tar-water, Bateman's Drops, Godfrey's Cordial, Worm-powders, and others, were all equally given, and to as little purpose; till, bewildered in a labyrinth of opinions, and distracted thro' their absurd credulity, they became as superstitious in this case for their beasts, as fatalists are with regard to themselves. They would only bleed, and give milk-pottage, because they deemed them innocent; and when, by loss of blood or scouring, the cattle died, they left the whole to providence, *they said*; but more properly to the course of the distemper: if they were cured, *they say* it was WELL; if they died, *they said*, *no one knew any thing of the matter, nor could any thing have done them good.*

*Præterea nec jam mutari pabula refert,
Quæsitæque nocent artes: cessere magistri †.*

Nor change of pasture could relief impart;
Destructive proves each vain attempt of art:

Fathers of medicine *can heal* no more †.

* See Gent. Mag. vol. xvii. p. 65, where the BISHOP of CLOYNE, in a letter to the learned DR. HALES, wishes he could introduce the general use of tar-water for this murrain.

† VIRGIL. Georg. lib. iii. ver. 547.

† WARTON's translation.

No

INTRODUCTION. 5

No wonder that opportunities of investigating this calamity grew daily less frequent. Seeing no abatement or relief, the governing power issued out orders, wisely calculated to stop the progress, by killing the beasts immediately upon the first signs of infection *. The physicians broke up their meetings, in obedience to the orders of council. A visible decrease of the cattle, and some reasons to apprehend that persons had killed cattle sick of other diseases, for the sake of the reward, induced the legislature, to avoid all future impositions, by giving no longer a bounty.

There are not wanting, in all ranks of persons, many who wish to have a rational account of this direful contagion, and a fixed method of cure recommended. With a view to so beneficial an end is this essay drawn up; but I beg leave to assure them, that in vain will any man expect to cure this pestilential disease by any one single medicine, let it be never so well compounded or adapted. *Panacea*, specifics, infallible, or universal medicines, can neither be allowed of, nor are they now-adays trusted to, nor relied upon. RAMMAZINI † tells us, in this very case, "That as long as we have not a specific and particular

* See London Magazine for Dec. 1745, p. 598.
 † In id unum incumbendum esse, persuasum habeo, ut per universalia pharmaca (quando particulare & specificum hujus veneni remedium non habemus) miasma istud pestiferum extinguatur, aut saltem enervetur, ut

6 INTRODUCTION.

“ medicine, wherewith to cure this poisonous
 “ distemper, we are to make use of remedies
 “ which destroy the venomous quality, or
 “ decrease the strength of the pestiferous
 “ *fomes* to such a degree, that nature may
 “ recover its strength, and throw it out at the
 “ surface of the skin; since by the ulcers,
 “ pustules, and boils, which have made their
 “ appearance in such as have recovered, na-
 “ ture seems to have pointed out a method to
 “ us of proceeding with those that have not:”
 and, indeed, to have furnished hereby a plain
 indication that she follows the same regularity
 in this, as in other contagious and critical
 distempers.

There are two considerations which ought
 to have great weight in an inquiry of this kind,
 and promise that our researches will not prove
 fruitless.

The first arises from the brute subject in-
 fected, whose blood can only be vitiated by
 bad food, corrupted water, or violent driving*,
 except in the case of contagion; for though
 we too frequently destroy the human frame

*natura roborata illud ad cutis ambitum ableget atque ex-
 tradat, quando per ulcera, pustula, & tubercula in iis
 bobus qui evasere sponte excitata ipsamet natura, nobis in-
 digitavit qua via fit incedendum. RAMM. p. 460.*

*Nullo autem tempore & minime æstate utile est boves in
 cursum concitari; nam ea res aut cit alvum, aut movet fe-
 brim. L. JUN. MODERAT. COLUMELLA De Re Rustica,
 lib. vi. cap. 5. & ALDROVANDUS de Quadrupedibus bisul-
 cis, lib. i. pag. 80.

by

INTRODUCTION. 7

by intemperance, riot, and debauchery; our blood and humours become tainted, our fibres relaxed: enervated nature must bend, nay yield, to the attacks of a putrid or pestilential venom, notwithstanding all human art; yet with some assistance the cattle generally recover. Such is the advantage of obeying the laws of nature only. They give us signs of their illness by the refusal of their food, their drink, and their inability for exercise or work. What can occasion this refusal of their fodder, if they have not been over-drove? What their difficulty of swallowing their drink, their shiverings, debility, and fever? Will it not appear, by these symptoms, that a putrid matter infects the whole mass of blood, tho' it generally falls more severely on some particular parts?— This will be demonstrated in the chapter on dissections.

Therefore no sooner do the symptoms point out the disease, but they also point out the method of treating it, according to its several stages.

The second consideration, and of no less advantage, is, that these creatures being ignorant of the consequences of any disease, nature is neither obstructed nor disturbed by the violent passions of a turbulent or dejected mind *. Provided the keeper permits the beast to be at quiet, and does not administer an improper

* SANCTORII Aphorism. sect. vii. De Anim. Affectibus.

8 INTRODUCTION.

medicine, nature may go on in her course; and, if the creature be slightly infected, work out a cure without assistance.

Such instances the small-pox affords daily in the human species. There is such an analogy between these two contagious distempers, that there would be the same reason to neglect the attendance on all persons under the small-pox, because some have it so slightly as never to keep within, as there would be not to attend the distempered cattle, because some recover without the least attention. Nature, therefore, if not obstructed, sometimes *without*, but generally *with*, the assistance of art, will restore these distempered creatures, at the regular period of the disease; since they are not subject to intemperance, nor the affrighting passions of the mind *, which *might* protract the distemper, or render it more destructive †.

* Les animaux au contraire, dont la nature est simple & purement materielle ne ressentent ni combats intérieurs, ni opposition, ni trouble; ils n'ont ni nos regrets, ni nos remords, ni nos esperances in nos craintes. Discours sur la Nature des Animaux, Hist. Naturelle, par Mess. de BUFFON & d'AUBENTON, tom. iv. p. 77.

On peut le prouver par des exemples familiers non seulement ces animaux ne savent pas ce qui doit arriver, mais ils ignorent même ce qui est arrivé, &c. Ibid. p. 108.

† BAKER Dissertatio de Affectibus Animi, p. 15, 16, &c.



CHAP.

C H A P. I.

Of the Origin, Nature, and Causes of
the contagious Distemper.

ANcient history, both sacred and profane, furnish us with accounts of pestilential diseases among the horned cattle. One of the forest plagues which God inflicted on the obdurate king of Egypt, near 1600 years before Christ, was the destruction of all the Egyptian cattle in the field, either by a murrain, or by *boils and blains**.

In the days of ROMULUS a great plague, after destroying the fruits of the earth and the cattle, swept off many of the ROMANS and LAURENTES, says PLUTARCH: to which † LIVY adds, “ That the consuls had the greater difficulty to raise their recruits, because the plague, which the year before had raged among the horned cattle, was then broke out upon men.”

* Exodus ix. ver. 3, 6, 9.

† Delectus consulibus eo difficillior erat, quod pestilentia quæ priori anno in boves ingruerat, eo verterat in hominum morbos. LIVY, lib. xli.

10 *Of the contagious Distemper*

PLUTARCH in his life of NUMA, and || LIVY yet more fully, relate, that in the year 355, of the Roman æra, there was such a plague over all sorts of animals, that neither the cause nor cure being discovered, processions, offerings, and supplications were made in ROME, during eight days, to the pagan gods, to appease their wrath, and avert the disease.

* COLUMELLA, one of the first writers on agriculture, gives the earliest account of distempers among the cattle. The *malis* described by † GESNER and ‡ ALDROVANDUS, bears a great resemblance to the disease now in England, especially that sort of *μάλῃς* termed *ὑποδερματῖτις*.

The severest plague of this kind appeared in the year of our Lord 810, when not only every head of cattle was destroyed in the emperor CHARLEMAIN's army, but also throughout all his dominions. This § LANCISI informs us from the German annals of METZ, those of TUSCANY and EGINARDUS. He also quotes FRACASTORIUS and WEIERUS, who both saw the same disease. Add to these, ¶ RAMMAZINI his account of this distemper in the Venetian state, anno 1514 and 1599; taken, the first from FRACASTORIUS, the lat-

|| LIV. lib. v.

* COLUMELLA de Re Rustica, lib. vi.

† GESNER, lib. i. De Quadruped. cap. 43.

‡ ALDROVANDUS De Quadruped. vind. lib. i. cap. i.

§ LANCISI De Bovilla peste, part. iii. p. 110.

¶ RAMMAZINI, p. 450.

ter



ter from the registers of the shambles at PADUA, when all beef and veal, and likewise milk, were forbidden by the senate to be eat throughout their state.

Thus far the authorities are indisputable, and, except the following miracle, the subsequent may be as good; but, notwithstanding the assertion of a cardinal, I believe only such as have an implicit faith will trust to it. Cardinal BARONIUS says, that in the year 376, when the cattle died of the plague all over EUROPE, *none escaped but such as were marked on the forehead with the sign of the Cross, by which miracle many people were converted to Christianity.*

The Italian physicians of this century are silent as to any such miracle in their time.

Of late years the distemper has been regularly traced in EUROPE. || RAMMAZINI and LANCISI both declare, it was brought, anno 1711, from HUNGARY by sea through DALMATIA into the neighbourhood of PADUA, by means of a bull or an ox, which was put into the grounds belonging to the rev. count TRAJAN BORROMÆUS, canon of PADUA. It spread all over the VENETIAN state, ravaged all ITALY, particularly the MILANESE and the FERRARESE; thence, in 1713, it appeared in the kingdom of NAPLES, and extended itself through the country about ROME to ROME,

|| RAMMAZINI, LANCISI, loc. cit.

by

12 *Of the contagious Distemper*

by the avarice of the merchants. * It then passed through the TYROLESE into GERMANY, FRANCE, FLANDERS, HOLLAND, GREAT BRITAIN, and also into DENMARK.

The distemper, which has made such havoc and still rages among the cattle, not only in some parts of this kingdom, but also in GERMANY, and most of the northern parts of EUROPE, broke out afresh in ENGLAND about eleven or twelve years ago. The progress of it has been traced through the same countries that the former passed, which broke out in 1711 and 1713. It is recorded by Dr. MORTIMER, § that Mr. THEOBALD observed, "The first infection of this dreadful calamity among the cow-kind, was brought over from Holland in 1745, by means of two white calves which a farmer at POPLAR near LONDON sent for, in order to mix the breed; that it spread into BERKSHIRE by two cows brought out of ESSEX; and that in the clothes of such persons as attended the sick cows, there was observed a disagreeable smell."

Others assure us, that the lucrative views of an English tanner, who bought a parcel of distempered hides in ZEALAND very cheap, because they were forbid to be sold there, and should have been buried, transplanted this dreadful disease among us. Thus by one

* RAMMAZINI, LANCISI, loc. cit.

§ Gent. Magaz. vol. xvii. p. 55.

man's unlawful gain, (if by this way it was conveyed) the ruin of many graziers and farmers was effected.

Though I cannot pretend to vouch for the truth of these relations, yet it is more than probable this distemper was propagated by some such means.

In the beginning of the late king's reign, a disease of this kind is said to have been fatal to the horned cattle, and proper regulations were made: since that time no such *epidemic* illness was observed in these kingdoms, and although many causes may concur to heat their blood, render it putrid, and bring on fevers of a malignant nature; such as the change of the seasons, the variations of the air, over-heating the beasts by driving, bad food, worse pastures in low and marshy grounds, drinking stagnating and stinking water full of living and dead insects, animal and vegetable particles in a corrupt state; yet all these combined together, tho' productive of many disorders, by their disposition to raise a ferment in the blood, never produced such a fatal and universal distemper as this.

The same countries which breed the plague and small-pox, seem to have propagated this contagion. The autumnal heats in ASIA or AFRICA, the putrid effluvia from the NILE, or from corrupted stagnating waters, are sufficient to contaminate the blood and juices of the cattle.

14 *Of the contagious Distemper*

So dreadful a disease is not *endemic* in our climate, notwithstanding the air should convey the highest putrefaction from the *effluvia* of dead carcases or rotten vegetables*. In all † seasons of the year doth this contagion appear, which with the means whereby it is spread, and those found useful to prevent its communication, afford further proofs that it must, like the small-pox, the measles, and the plague, have been brought to us, and is communicated in the same manner.

Wherever this pestilential contagion reigns, the air is full of exhalations from morbid animals ‡, and other bodies; and within a certain distance will carry the *effluvia*, and infect other animals of the same species; but this conveyance has its bounds ||. Dr. MEAD observes, "That the smoak of London, tho' it exceeds by much the quantity of any pestilential *effluvia*, does not reach many miles." The air therefore does not bring this disease over to us from so great a distance, but the same means which transplant the contagious diseases abovementioned, will most effectually spread this. Cattle recovered from the infection, or brought over from an infected herd; the putrid and highly volatilized *miasmata*, received and fixed into the clothes of persons attending

* MEAD on the Plague, p. 37.

† SYDENHAM de Morb. acut. p. 3.

‡ MEAD de Imperio Solis ac Lunæ, p. 20.

|| MEAD on the Plague, p. 69.

on the cattle, into the wool of sheep §, the hairy coverings of horses, hogs, cats, and dogs; the putrid *exhalations* arising from dead carcasses, or their distempered hides; are as many and different ways of communicating the infection. The dung of infected cattle, the straw they lay upon, nay, even the fodder they have breathed on, will, as the poet says, be infected *, and spread the malign influence.

By some one of these means, most certainly, was this disease introduced; so that, according to all human probability, had it not been brought into these islands, we should not have known it; but now may, unless the Divine Goodness bless our endeavours, continue to be liable to its frequent and severe returns, before this contagion be totally extinguished.

It sometimes happens, as in other *epidemic* distempers, that only such herds or stocks are infected where the contagion first breaks out. This may be owing to the care of such farmers as keep their cattle free from the least communication with the distempered, and are particularly careful what beasts they buy, and from whom. Sometimes the wind will blow so constantly from one and the same corner, that all the pastures adjoining shall be visited with this ravaging distemper, and only one shall escape; which was the case of a grazier,

§ See Mr. COLLINSON's, Mr. HOFFMAN's, and Mr. THEOBALD's accounts, *Gent. Magaz.* vol. xvii. p. 56.

* ——— *infecit pabula tobo.* VIRG. *Georg.* lib. iii.

who

16 *Of the contagious Distemper*

who told me, that all the cattle about him were infected, while his remained perfectly sound; but about a year after he lost half his stock by the contagious disease: it then stopt, and did not spread to his neighbours.

This disease is peculiar to the horned cattle, and, like that which in † 1710, or 1711, proved so destructive to the sheep in ENGLAND, neither infects men, nor communicates itself to any other part of the brute creation. I have seen sheep, hogs, young pigs, horses and dogs, in the midst of the infection, without being the least affected by it. From which observation I infer, it is a pestilential fever, *sui generis*, to which horned cattle are alone subject §.

And herein I have the authority of the learned Dr. MEAD ||; who tells us, “he is well aware that there are *plagues* among animals, which do not indifferently affect all kinds of them, some being confined to a particular *species* (like the disease of the *black cattle* here, a few years since, which neither proved infectious to other brutes, nor to men.”)

† The great father of physic has explained the reason why pestilential diseases confine themselves often to a peculiar *species* of ani-

† FULLER'S *Exanthematologia*, p. 168.

§ SENNERTI *Opera*, tom. iii. lib. vi. p. 3 & 4.

|| MEAD on the *Plague*, p. 88.

† HIPPOCRAT. *De flatibus*.

mals. After laying it down as a rule, that all distempers are communicated by the air, he distinguishes two sorts of fevers; one of which is general, sparing no body, and called by him *λοιμος, pestis*, or a pestilential fever. The other a particular one, seizing only individuals, and arising from some error in diet. Yet air, says he, is the author or parent of both *.

* Quumque animadvertas, tam vastæ semina labis,
Esse nec in terræ gremio, nec in æquore posse,
Haud dubiè tecum statuas, reputesque necesse est,
Principium sedemque mali consistere in ipso
Aëre, qui terras circum diffunditur omnes;
Qui nobis sese insinuat per corpora ubique,
Suetus & has generi viventium immittere pestes.
Aër quippe pater rerum est & originis auctor.
Idem sæpe graves morbos mortalibus affert,
Multimodè natus tabescere corpora molli,
Et facile affectus capere, atque inferre receptos.

FRACASTOR. Syphil.

These seeds of dread contagion cannot lie,
Or in the earth, or sea, or starry sky;
Which point well weigh'd, their vehicle we place
In air, that fills the vast æthèrial space;
Pertraves thro' all this wide extended scene,
Thro' worlds, thro' plants, thro' animals, and men:
To this their spring the vital powers owe,
Hence ill's unnumber'd, and diseases flow;
Hence burning fevers rage with mortal flame,
Or languid hectic's waste the tender frame:
The passive air each baneful steam receives,
Spreads wide the vapour, and th' infection gives:
By healthful gales, or pestilential breath,
At once the source of life, and cause of death.

C

Then

18 *Of the contagious Dissemper*

Then adds the venerable old man *,
 "Therefore this general fever seizeth almost
 "all those who breathe the same air, and the
 "same fevers will arise alike in those bodies
 "wherein the same air has been admitted."
 Perchance, resumes he, some one may ask,
 "why these diseases do not affect all animals
 "in the same manner, but confine themselves
 "to some particular sort? This is the reason;
 "because in their bodies, their nature, and
 "their food, they differ from each other.
 "Neither are all things equally proper, or im-
 "proper to every species of living creatures :

Ο μὲν οὖν κοινὸς πυρετὸς
 διὰ τοῦ αἵματος ἐστίν, ὅτι τὸ
 πνεῦμα τῶντο πάσης ἐκκο-
 σιν, οἷον δὲ, ὁμοίως τὰ πρὸς
 μᾶλλον περὶ σωματὶ μὴ ὅμοιος
 ἰσχυρὰ, καὶ οἱ πυρετοὶ χιρὸνται.
 Ἄλλ' ἴσως ἐπεί τίς· διὰ τί
 οὐκ ἅπασιν τοῖσι ζώοις, ἀλλ'
 ἐν τινὶ αὐτῶν ἐμφανίζονται
 αἱ τοιαύται νόσοι; ἀποστ. καί
 πρὸς ἀντιφρονεῖται ὁ σῶμα, καὶ
 φύσις φύσις, καὶ τροφὴ
 τροφῆς. ὁ γὰρ πᾶσι τοῖσιν
 ἔσται, τῶν ζώων πάντα, οὐ
 ἀναρμοσὰ ἢ εὐαρμωσὰ ἐστίν,
 ἀλλ' ἕτερα ἑτέροις. Εὐμωρὰ
 ὀχλῶν μὲν οὐκ ἀπὸ τοιούτοις
 πληθὺν μὴ δύνανται, ἀπὸ
 πῆν φύσις πολέμια ἐστίν, ἀπὸ
 θραύει τότε νοσέουσιν. Ἐπὶ δὲ
 ἑτέροις τινὲς ἔσται ζῶον ἀπὸ ἀ-
 ἄρμος, ὅτι, τὰ σῶμα καὶ
 νοσέουσιν.

Communis igitur febris ideo
 communiter omnes invadit, quod
 eundem omnes spiritum attra-
 hunt, & simili corpori spiritu si-
 militer permixto, similes oriun-
 tur febres. At forte objiciat quis-
 piam, cur igitur non omnibus
 animantibus, sed alicui ipsorum
 generi ejusmodi morbi contin-
 gunt? Cujus rei causam esse
 dixerim, quod corpus a corpore,
 natura a natura, & alimentum
 ab alimento differt.

Neque enim cuius animan-
 tium generi eadem sunt com-
 moda aut incommoda; sed alia
 aliis convenient. Cum igitur aer
 inquinamenti hujusmodi, quæ
 hominum nature adversantur,
 plenus fuerit, tum homines æ-
 grotaut. Quando verò alteri
 quidam animantium generi aer
 incommodus fuerit, tunc eo
 morbo corripitur.

ΙΠΠΟΚΡΑΤΗΣ, ΠΕΡΙ
 ΦΥΣΩΝ.

HIPPOCRATES A FOESIO Liber
 de Flatibus, tom. i. p. 297.

" some

“ some are suitable to the one, some to others.
 “ Whenever therefore the air is infected with
 “ such particles as are obnoxious to human
 “ nature, men will be sick: but when the air
 “ contains particles hurtful to any other sort
 “ of living creatures, they will be seized with
 “ that disease.”

* LANCISI illustrates this opinion of HIP-
 POCRATES, by the following instances:
 “ Starlings eat Hemlock, Quails eat Hel-
 “ lebore, and Thrushes feed on, *Cantharides*,
 “ without the least harm; whereas they are
 “ poison to man, or any other living crea-
 “ tures.” What constitutes the salubrity of
 the air, but its fitness for the body which is to
 receive it. Thus some breathe better in a thick
 air, than in a keener one; and many instances
 might be produced both of human and other
 living creatures, who have been immediately
 destroyed, or revived upon a change of air.
 Should it be asked, why the pestilential
 contagions that destroy animals spare man-
 kind; when, on the contrary, the plague,
 so fatal to men, sweeps off along with it all
 the brute creation; and fowls of the air, with-
 in its reach? I answer, that the juices of the
 human body being by far more elaborated and
 refined, than those of any other living crea-
 tures under the sun, they also contract, when
 vitiated, the highest degree of putrefaction,

* LANCISI de Bovilla peste, part. iii. c. 3.

20 *Of the contagious Distemper*

and, probably, being more subtle and active than those of other animals, is the reason why the latter are destroyed: while their putrid *effluvia* are only nauseous to us, without any deadly effect. No other ill consequence has appeared from the eating the flesh of distempered cattle, or using their milk, than might be expected from the daily practice of those who feed on putrid meat through choice: of course, such diet must supply the blood with putrid chyle, that, unless discharged by some emunctory, will raise a ferment †, possibly taint the whole mass of blood, and in time destroy the body.

It is obvious to every one, that this pestilential distemper, though confined to the horned cattle, is still of terrible consequences to human society. It answers, by the destruction of so many beasts, to the ravage which the plague causes among men. Whoever desires an account of such calamities, may read † THUCYDIDES his elegant description of the plague at ATHENS; § LUCRETIVS on the same subject; Dr. MEAD's discourse on the plague: but || VIRGIL's description of the diseased cattle comes nearer to our purpose.

Such

† LANGRISH's Theory of Physic, p. 356, Art. 613.

† THUCYDIDES (*Hudsoni*) Hist. lib. ii. p. 110—115.

§ LUCRETIVS, lib. vi. ver. 1123, & seq.

|| Jamque catervatim dat stragem, atque aggerat ipsis
In stabulis turpi dilapsa cadavera tabo:
Donec humo tegere, ac foveis abscondere discunt.

Nam

Such a decrease of cattle must necessarily deprive all ranks of people of a most substantial part of their nourishment, and greatly distress the farmers in the culture of their grounds, in their dairies *, &c.

† LAN-

Nam neque erat coriis usus; nec viscera quisquam
Aut undis abolere potest, aut vincere flamma.

VIRG. Georg. lib. iii. ver. 556, &c.

At length whole herds to death at once it sweeps;
High in the stalls it piles the loathsome heaps,
Dire spectacle! till sage experience found
To bury deep the carrion in the ground.
Useless their hides; nor from the flesh the flame
Could purge the filth, nor steams the savour tame.

WARTON'S Translation.

* In the remotest ages, when idolatry and superstition were the natural offspring of the ignorance of those times, the EGYPTIANS, says DIODORUS SICULUS, from a principle of gratitude, seeing the many uses the horned cattle were of, first as their favourite beast, sacrificed them in an emblematical manner²; the bull for its beauty in their worship to the sun, and a black and white cow in honour of the moon. 3 Soon after they deified OSIRIS and

¹ Τοὺς δὲ Ταυροὺς τοὺς ἱε-
ροὺς, λέγων δὲ τὸν τὴν Ἀπὶν καὶ
Μνεῦιν τιμᾶσαι παραπλησίως
τοῖς θεοῖς, Οσίριδ' ὡς καὶ ἀδελφόν
αὐτοῦ. ἅμα μὲν διὰ τὴν τῆς
γεωργίας χρειαίαν, ἅμα δὲ καὶ
διὰ τὸ τῶν εὐρύων τοῦ καρ-
ποῦ τὴν δόξαν ταῖς τοῦτον
εὐσεβείαις παραδόσιμον γεγε-
νῆναι τοῖς μεταγενέτεροις εἰς
ἀπαίαν τὸν αἰῶνα.

ΔΙΟΔΩΡ. ΣΙΚΕΑ. βιβλ. α.

Tauri autem sacri APIS
(inquiunt) & MNEVIS, non
secus quam Dii honorantur
ut OSIRIS instituit, tum
propter agriculturæ usum,
tum etiam ut gloria illorum
qui fruges reperissent, unâ
cum meritis, ad omnem pos-
teritatis memoriam propaga-
retur.

DIODOR. SICUL. lib. i. p. 79.

² JACKSON'S Chronology, vol. ii. p. 380, 381.

³ Ibid. p. 161.

22 *Of the contagious Distemper*

† LANCISI has refuted the vulgar notion that the bite of the *Buprestis*, a sort of venomous insect, or worms caused this disease. In ENGLAND no such insect has appeared; and worms, so commonly found in the first passages of horned cattle, horses, &c. are known to breed and increase wherever they find a proper *pabulum*. Some are hatched by corruption, others are killed by putridity, and different parts of the body have procured an asylum and nourishment to different sorts of worms, according to their *species*.

What particles constitute the pestilential *fomes*, how, and in what manner it acts, I shall not take upon me to determine *a priori*; but leave to others to philosophize on, and refer them to the authors already mentioned. Thus far I will venture to affirm, that either by inspiration, or deglutition, *effluvia* of a very subtle and active nature are drawn in, which first vitiate the fluids, then relax, and destroy the solids of the cattle.

The several stages, the progress, and effects of this contagious distemper, are exactly the

Isrs, consecrating the bull to their king, and the speckled cow to their queen, whose memory they revered in the highest degree⁴. From the EGYPTIAN idolatry the ISRAELITES chose their god, and worshipped the golden calf⁵.

⁴ Ibid. p. 160 to 165.

⁵ Exodus xxxii.

† LANCISI de Bovilla peste, part. iii. cap. v. & vi.

same

same with those observed in the small-pox, as will be demonstrated in the following pages ||.

|| *Causas rerum naturalium non plures admitti debere, quam quæ & veræ sunt, & earum phenomenon explicandis sufficient.*

Ideoque effectuum naturalium ejusdem generis eadem sunt cause.

NEWTON, *Regulæ philosophandi*, 1^{ma}, & 2^a, in principis, p. 357.

CHAP.

C H A P. II.

Of the Symptoms.

AS we observe in the small-pox, and all other putrid or eruptive fevers by which human nature is infected, a regular progress; so in this pestilential fever is the course of the contagion, through its several stages, to be traced by the symptoms †.

All are not equally seized: many reasons may be assigned for a slight or violent infection; but, according to the degree of infection, the *diagnostics* or signs are more or less the same.

The first appearance of this infection is a decrease of appetite; || a poking out of the neck, implying some difficulty in deglutition; a shaking of the head, as if the ears were tickled; a hanging down of the ears, and deafness; a dulness of the eyes; and a moving to and fro, in a constant uneasiness. All these

† *Ipsa pestis quid obsecro, aliud est quam symptomatum complicatio, quibus utitur natura ad inspiratas unà cum aëre particulas putrescentes, per emunctoria, apostematum specie vel aliarum eruptionum operâ, excutiendas.* SYDENHAM de Morb. Acut. p. 2.

| *ARETÆUS de Morb. Acut. p. 20.*

signs,

signs, except the last, increase till the fourth day. Then a stupidity and unwillingness to move, great debility, a total loss of appetite, a running at the eyes and nose, sometimes sickness and throwing up of bile †, a husky cough, and shivering. The head, horns, and breath are very hot, while the body and limbs are cold. The fever, which was continual the three first days, now rises and increases towards evenings; the pulse is all along quick, contracted, and uneven. A constant *diarrhæa*, or scowering of foetid green *feces*, a stinking breath, and nauseous steams from the skin, infect the air they are placed in. The blood is very florid, hot, and frothy. The urine, or stale, is high coloured; the roofs of their mouths and their barbs are ulcerated. § Tumours or boils are to be felt under the *panniculus carnosus*, or fleshy membrane of the skin; || and eruptions appear all along their limbs, and about their bags. If a new milch cow be thus ill, her milk dries up gradually, her purging is more violent, and on the fourth day she is commonly dry. There is such acrimony or sharpness in their dung, that a visible irritation is to be observed during some time *in ano*. They groan much, are worse in

† ARETÆUS de Morb. Acut. p. 20.

§ Gent. Mag. vol. xvii. p. 153. RAMMAZINI de Contag. Epid. LANCISI de Bovilla peste, part. iii. cap. viii.

|| ALDROVANDUS de Quadruped. bisulcis, lib. i. p. 110. de *malide subtercutanea*.

the evening*, and mostly lying down. These symptoms continue increasing till the seventh day from the invasion, on which generally, tho' sometimes protracted till the ninth, the crisis or turn takes place.

And now, to be as concise as possible, I proceed to point out, in the next chapter, the *prognostics* or signs which denote the cure or the loss of the beast.

*HIPPOCRATES, lib. de *Indicationibus*.—Observavi semper in morbo vehementiori aegram sub vesperam quasi paroxysmo laborare & functionia symptomata vespertinis præferam horis se ostendere atque exacerbari. SYDENHAM de Variolis, p. 101.

CHAP. III.

Of the Prognostics.

Difference in constitutions occasions different effects from the same contagion, as well in the brute creation as in the human body. This will occur to every attentive observer, therefore I shall not make the least offensive comparison.

The same rule which VIRGIL * observed in the choice of a horse, may be followed in choosing any of the horned cattle: probably their colour may indicate the degree of their strength; the *black*, as having the strongest fibres composing their solids, and most globular blood: next to these the *dark bay*; then the *light bay*, the *pie-ball*; but the worst of all colours are the *brindled*, *fallow*, or *white*; possibly on account of their fibres being more relaxed, and their fluids abounding with more *serous* or *lymphatic* juices †. Be that as it may, it

Spadices glaucique color deterrimus albis
Et gilvo. VIRG. Georg. lib. iii. ver. 82.

† A *white* cow generally gives most milk; but then, being more *serous*, is neither so nourishing, nor so proper for making butter or cheese. The *red* cow's milk is more elaborated, tho' less in quantity; consequently affords more nourish-

28 *Of the contagious Distemper*

it is very certain these different cattle were affected in a greater or lesser degree by the contagious and pestilential distemper, according as they answered the colours just described.

* GEORGIUS ALEXANDRINUS, writing to the senator JUSTINIANUS, tells him, that VIRGIL, in his Georgics, has introduced many things from VARRO.

Of the three antient writers on husbandry, CATO, whom PLINY † calls the oldest, sets down no rule relating to the choice of cattle, nor their colour: VARRO and COLUMELLA agree in the same directions; and should their opinions confirm my suggestion, the foregoing observation will deserve some notice.

MARCUS TERENTIUS VARRO very circumstantially and minutely thus directs his countrymen in the choice of horned cattle:

nourishment. The *black cows* may not yield so much milk as the two former; but it will be thicker, of a richer substance, and best adapted for the uses of the dairy. Yet it may be necessary to mix these several sorts, for the different purposes intended. *Histoire Naturelle*, tom. iv. p. 456.

* Vide ALEXANDRINI Epistola ad JUSTINIANUM, in edit. scriptor. de re rustica.

† Primusque & diu solus idem ille M. CATO omnium bonarum artium magister, paucis dumtaxat attigit, boum etiam medicinâ non omisâ. Catonum ille primus triumpho & censura super cætera insignis, magis tamen etiamnum claritate litterarum, præceptisque omnium rerum expetendarum datis generi Romano, inter prima vero agrum colendi, illius ævi confessione optimus ac sine æmulo agricola. PLIN. Nat. Hist. II. lib. xxv. p. 359, & I. lib. xiv. p. 712.

“ Who-

“ * Whoever would buy stock, must first ob-
 “ serve, that the cattle be rather of a proper
 “ age for breeding, than older, and such as
 “ have bred. That they be well made, with
 “ sound limbs, long shaped, and large; with
 “ black horns, broad foreheads, large black
 “ eyes, hairy ears, thin jawed, and flat nosed,
 “ a high back with a gentle fall, wide nos-
 “ trils, black lips, thick and long necked,
 “ the dewlap hanging loosely from the neck,
 “ the body large and well ribbed, broad
 “ shoulders, good buttocks, a tail hanging
 “ down to their heels, having at the end a
 “ good quantity of strong curled hair, the
 “ legs well made, rather short than long,
 “ strait knees with a rising in the middle, nar-
 “ row feet, which neither are apt to split when

* Qui gregem armentorum emere vult, observare debet
 primum, ut sint hæ pecudes ætate potius ad fructus ferendos
 integræ, quam jam expertæ. Ut sint bene compositz, ut
 integris membris, oblongæ, amplæ nigrantibus cornibus,
 latis frontibus, oculis magnis & nigris, pilosis auribus, com-
 pressis malis, submissivæ, gibberi spina leviter remissa, aper-
 tis naribus, labris subnigris, cervicibus crassis ac longis, a collo
 palearibus demissis, corpore amplo bene costato, latis hume-
 ris bonis clunibus, cauda profusa usque ad calces, ut habeat
 inferiorem partem frequentibus pilis subcrispam, compactis
 cruribus, potius brevioribus quam longis, rectis genibus, &
 eminulis distantibus inter se, pedibus non latis, neque ingre-
 dientibus qui displodantur, nec cujus ungulæ divaricant, &
 cujus ungues sint leves & pares, corium tactu non asperum,
 ac durum, colore potissimum nigro, deinde rubeo, tertio helvo,
 quarto albo; mollissimus enim hic ut durissimus primus. De
 mediis duobus prior quam posterior melior, utrique plaris quam
 nigri & albi. M. T. VARRO de re rustica, lib. ii. cap. 5.
 Histoire Naturelle, tom. iv. p. 456, 457.

“ they

30 *Of the contagious Distemper*

“they walk, nor their hoofs to part; the
 “hoofs also must be even and sound, the hide
 “soft and smooth, of a black colour preferably
 “to any other, next of a red, thirdly bay,
 “fourthly white. The first sort is the strongest
 “and hardiest, the latter by much the weakest,
 “tender, and less able to bear fatigue. Of the
 “red and the bay, the first is to be preferred:
 “But both these are to be chosen rather than a
 “mixed colour of black and white.”

COLUMELLA's advice runs thus: “§ Such
 “horned cattle are to be bought as are young,
 “well shaped, full limbed, with strong and
 “large black horns, a broad and uneven fore-
 “head, thick and hairy ears, black eyes and
 “lips, flat and wide nostrils, a long and fleshy
 “neck, with a large dewlap hanging down
 “almost as low as their knees, full chested,
 “wide shoulders, and a capacious belly as if
 “big with calf, long sides, thick loins, a
 “strait, even, and somewhat falling back,
 “round fleshy buttocks, strait and well-shaped

§ Parandi sunt boves novelli, quadrati, grandibus mem-
 bris, cornibus proceris ac nigrantibus, & robusti, fronte late
 & crispâ, hirtis auribus, oculis & labiis nigris, naribus resi-
 mis, patulisque; cervice longa & torosa, palaribus amplis,
 & pene ad genua promissis, pectore magno, armis vastis,
 capaci & tanquam implente utero, lateribus porrectis, lumbis
 latis, dorso recto, planoque, vel etiam subsidente, clunibus
 rotundis, cruribus compactis ac rectis, sed brevioribus potius,
 quam longis, nec genibus improbis, ungulis magnis, cau-
 dis longissimis, & setosis pilosisque, corpore denso brevique,
 colore ruber, vel fusco tactu corporis mollissimo. COLU-
 MELLA de re rustica, lib. vi. cap. i. De bubus parandis,
 atque emendis, earumque formâ.

“legs,

" legs, rather short than long, good knees,
" wide hoofs, long tails full of strong and
" curling hair, the body fleshy and compact,
" of a red or brown colour, with a soft and
" silky hide."

But to return. Bulls and oxen are not so violently attacked as cows and calves; and of these, cows with calf, and weakly cow-calves, are in the greatest danger.

Should a cow with calf, at the critical time of this disease, slip her calf, she then takes her fodder, and recovers: some may only give signs of such abortion, and hear their calf several days, nay even weeks, before they slip it, and yet recover. Calves receive the infection from the cow by sucking her milk, and may also, if first seized, infect the cow.

This disease, being a contagion, of the pestilential kind, is susceptible at all times and seasons: in autumn and summer it will rage most, in spring and winter least, according to the alterations commonly happening in these seasons. At the time of new and full moon*, farmers observe the greatest number of cattle fall of this illness; but the fatality which, as DIEMERBROEK relates†, attended those who were seized with the plague, at such changes of the moon, was not so great among the cattle. He says, that almost all died. I found no difference as to the loss of more or fewer

* MEAD de Imperio Solis ac Lunæ, p. 67.

† DIEMERBROEK de Peste, p. 9.

beasts,

32 *Of the contagious Distemper*

beasts, in different times. May we not endeavour to account for, and reconcile these opposite observations thus? That supposing, with Dr. MEAD †, the influence of the celestial bodies on the human and brute creation equally powerful, yet, as brutes are limited in their conceptions, they are exempt from that fear, and those apprehensions of a contagious disease, which man alone feels in the most dreadful and affrighting light, continually expecting the first seizure to be speedily followed by his dissolution. Such terrible reflections may well increase the number of victims. § Dr. GEORGE BAKER has given us a very elegant description of what tragic scenes the passions of the soul act on the human body, in his learned dissertation lately published.

Having now shown the colour, sex, and age of the cattle more or less liable to infection, and noted the time of its spreading, let us consider by what signs we may expect a favourable event, and which will forebode a fatal one.

All epidemical distempers, says the great Dr. MEAD ||, “have their stated times of “height, commonly called their *crisis*, or “critical days.” In the contagious distemper, the fate of the beast is generally determined on the seventh day * from the invasion, tho’

some-
† MEAD, loc. cit.

§ BAKER de affectibus animi.

|| MEAD de Imperio Solis ac Lunæ, p. 68, 71, &c.

* HIPPOCRATES de diebus decretoriis, in lib. de Epidem.

sometimes it has been delayed till the ninth : but if, in consequence of ill-treatment or mismanagement, the beast should fall into such disorders as shall hereafter be specified, I cannot lay such miscarriages solely to the immediate cause of the contagion, but to a bad constitution, or want of care during and after the illness.

If therefore the following symptoms be observed on the seventh day from the seizure, namely, either * eruptions all over the skin, or boils as big as pidgeon's eggs in different parts of the body, but especially from the head to the tail, along each side of the spine or backbone, and so ripe as to discharge putrid and stinking matter, large abscesses formed in the horns †, or in some parts of the body ‡, the dung more consistent and firm, the urine thick, and not quite so high-coloured, if the beast has had a shivering, succeeded by a general glow of heat, upon which the fever has abated, and the heart beats regularly, without intermission, or hardness, if the nose be sore and scabbed, the eyes look bright and brisk, and the beast pricks up its ears at your going into the hovel or barn, and will eat a little hay or peas, whether, if a cow, she has slipped her

dem. prognost. & Aphorism. PROSPER ALPINUS de præfagienda vita & morte, lib. v. cap. 4. GALENUS de dieb. decret. & cris. p. 357.

* Gent. Magaz. vol. xvii. p. 152.

† Gent. Magaz. vol. xx. p. 525.

‡ Gent. Magaz. vol. xvi. p. 652.

D

calf,

34 *Of the contagious Distemper*

calf, or not; these symptoms will determine that the beast is out of danger.

But on the contrary, if on the seventh day from the invasion the eruptions, boils, or abscesses are decreased in bulk, or totally disappeared without having broke or discharged outwardly; if the scowering or purging continue almost constantly on the beast, the breath be very hot, while the whole body, limbs, and horns are cold, the groaning and difficulty of breathing increased, the running from the nose and eyes lessened, the eyes dim and sunk into the head, a perfect stupidity; the stale or urine dark coloured, the beating of the heart intermitting, and a cadaverous smell; if these or most of these symptoms appear, we may assuredly pronounce a beast under these circumstances incurable, and inevitably will soon die.

Within some hours of its death, there frequently arises on the back, upon the sinking of the small swellings, a large tumour or bag * filled as it were with air; pressing upon which, the contents will shove to and fro from the head to the tail.

This is not only mentioned by RAMMAZINI, but also by authors who deemed the disease to be only an inflammatory fe-

* Sicuti etiam ingentes vesicae solo flatu plene, quae dissecare, diram Mephitis, effluant; RAMMAZINI de contag. Boum. Epidem. p. 458.

ver;

ver*; it is called an *emphysema*, and will be described in the following chapter, wherein I shall give an account of what appeared on dissection.

* See an account of the epidemical distemper among the Black Cattle, printed by A. Millar 1745. p. 4. and Dr. Brocklesby's Essay on the Mortality among the Horned Cattle 1746, p. 62.

It is not to be expected that the dissection of a dead animal will afford any new information, but it is necessary to be acquainted with the structure of the parts, and the manner in which they are connected, in order to be able to judge of the nature of the disease, and the extent of the injury. The dissection of the lungs, and the examination of the vessels, will afford much information, and it is necessary to be acquainted with the structure of the parts, and the manner in which they are connected, in order to be able to judge of the nature of the disease, and the extent of the injury.

CHAPTER

Of the Dissection of the Lungs, and the Examination of the Vessels.

CHAP. IV.

Of Dissections.

Without a thorough knowledge of anatomy, all authors, both ancient and modern, agree, that the practice of physic would be guess-work at best; and certainly, to avoid quackery, and settle our practice on the most solid foundation, it is absolutely requisite to be well acquainted with the constituent parts of the body, the laws of the animal œconomy, the difference between the sound and morbid state, as also whether by the appearances upon a strict examination, the diseases arise spontaneously from the nature of the subject, or from external causes*. For CELSUS observes †, “As there arise
 “ pains and diseases of various kinds in
 “ the internal parts, it cannot be imagined
 “ that any one can direct proper remedies,
 “ who is unacquainted with the structure of
 “ those parts: therefore it is necessary to
 “ open dead bodies and examine their bowels
 “ and intestines ‡.”

* BOERHAAVE *Institutiones Medicæ*, p. 8.

† CELSUS in præfatione, p. 7. Præter hæc cum in interioribus partibus & dolores & morborum varia genera nascantur, neminem putant his adhibere posse remedia, quas ipse ignoret. Necessarium ergo esse incidere corpora mortuorum, eorumque viscera atque intestina scrutari.

‡ HEISTERI *Compendium Anatomicum*, p. 3.

The strictest examination of both morbid and sound carcases, proved of the greatest use towards ascertaining the effects of this contagious disease, and the method of cure to be followed. How could any one account for the difficulty of clearing the *primæ viæ*, after proper bleeding in the first stage of the distemper, who had never seen the structure of the different stomachs? Should vomits and purges have been given without being well informed of the mechanism, structure, and contents of the stomachs, and knowing whether there was a greater probability of their discharging the passages, than of bringing on an inflammation first, and afterwards a mortification by the irritation they must cause? Had the *crocus metallorum* purged favourably, or brought on a perspiration as it generally doth in quadrupeds, doubtless Dr. MORTIMER would have recorded it *. In the following anatomical review, we shall see, why neither vomits nor irritating purges could have the desired effect. I do not propose here to give the whole anatomical description of a bull, cow, or calf; whoever cannot follow the dissection themselves, or are too nice to attend the slaughter-house, may, in † messieurs DE BUFFON and D'AUBENTON'S *Histoire Naturelle*, read a very accurate account, and see the chief parts extremely well represented in the plates annexed.

* Gent. Mag. vol. XVI. p. 651.

† *Histoire Naturelle*, tom. IV.

38 Of the contagious Distemper

For brevity sake, I shall confine myself to some cursory remarks on the structure of such parts, as are chiefly the seat of, or mostly are affected by the disease. Besides the usual integuments, namely the hair which in horned cattle grow thick, long, and silky, the *epidermis* or scarf-skin, the *cutis* or skin, and the *membrana adiposa*, or cellular membrane, which contains the fat, there is also an integument situated between the skin and fat, composed of fleshy fibres, and called by the name of * *panniculus carnosus* or fleshy membrane. Its use in these horned creatures, and likewise in horses, sheep, dogs, and other quadrupeds, is to wrinkle up, and move the skin, so as to be able to throw off any insect, filth, or noxious matter sticking to it. All fleshy fibres have their artery, vein, lymphatic, and nerve; and doubtless there is an expansion of nervous filaments all over this membrane. From the thickness of the common integuments therefore, and particularly of the skin, eruptions may not always be observed unless they are felt. And from the sensibility of this membrane, the rigors and *horripilationes* or shiverings, may likewise be accounted for, at a time that nature is forcing out the acrid pestilential matter, which in its passage wounds this nervous expansion and the skin.

The horns are a thin long cavity, containing a medullary substance called pith or mar-

* HEISTERI Compendium Anatomicum, p. 54

row, of the same consistence with that found in the *frontal sinus*, of which the horns are a continuance *. Arteries, veins, nerves, and lymphatic vessels compose the glands which fill these cavities, and serve not only by the oil they separate, to lubricate the bones and horns, but also to give such a firmness and strength to the latter, that they may arm the beasts sufficient for their defence: the communication through the nostrils and nose to the *sinus frontalis*, is plain enough. Should the contagious *effluvia* be drawn up this way, then arise inflammations, mortifications, tumours, abscesses, and ulcers along the nose, in the *sinus*, and in the horns. The same effects appear on the glands of the throat and mouth, which are of the same texture. Verifications, *phlyctenæ*, and ulcerations, like those related by Dr. FOTHERGILL † in his account of the putrid sore throat, are common in this disease. These similar symptoms have not only convinced observers that this distemper is of a putrid nature, but moreover afforded a similar indication of cure.

* Nutrimentum quod ad superiores dentes quibus carent abire debet, in cornua abit; suntque multiplicis differentie. JOHNSTON de quadrupedibus, lib. 2.

† FOTHERGILL's account of the sore throat attended with ulcers. In January and February 1755, this sore throat appeared in Huntingdonshire. The method this gentleman directed succeeded, and none died but one girl of twenty years of age, who was treated improperly.

40 *Of the contagious Distemper*

The deafness may be occasioned partly by a relaxation of the *Eustachian tube*, which opens into the mouth, and is compressed by the neighbouring glands relaxed and distended with lymph, and partly by a relaxation of the auditory nerve, the muscles and membranes of that organ.

The *œsophagus* or *Gullet*, the *Aspera, seu Trachea Arteria*, or *Windpipe*, the lungs, heart, kidneys, bladder, I shall give no description of; almost every one knows their texture, and in what manner they are affected, the dissections will hereafter set forth.

I come now to that admirable contrivance by which the Almighty Creator has provided these beasts with the means of digesting their food, amply making amends for their want of sharp teeth, the *incisores*, in the upper jaw*.

I. All ruminating animals have four stomachs, each distinguished by a particular name, either to denote its dimension, figure, or action, as, first, *κοιλία*, *venter*, *rumen*; by the ancients, *panse herbier ou double*, by the author of l'Histoire Naturelle, and in our language *paunch*, *belly*, *cud-bag*, and *single tripe*. This first stomach is the largest of the four in a full-grown beast, but in a young calf is less than the fourth †, because a calf makes less

* Inde factum ut dentium defectum ventrium multitudine natura pensaret. JOHNSTON, lib. ii. de quadrupedibus, cap. i. de ruminant. corrig.

† Hist. Naturelle, tom. iv, pag. 462.

use of this stomach, eating a small quantity of grass, chewing also little cud, the chief part of a young calf's food being milk, or such other liquid nourishment as can pass easily through all the stomachs, without requiring much digestion or preparation. The *tunica*, or coats of this stomach, are four, connected to each other by a cellular membrane, which sometimes is ranked among the number of coats. The first is a continuation of the *peritoneum*; the second is muscular, the fleshy fibres of which run in different directions, some from top to bottom longitudinally, others transversely, others obliquely. Moreover, two very strong *fasciculi*, or bundles of fleshy fibres, intersect each other at the bottom of this stomach; they are united by a broad cellular membrane, and form like the crown of an arch, dividing the bottom into four distinct cavities or bags; "These cavities," according to l'Histoire Naturelle*, "were not equal, the right larger than the left, being three feet nine inches in circumference, the left two feet eleven inches only; the circumference of the whole paunch was six feet ten inches. The *scissure* which divided these cavities, and formed the external convexities, was ten inches in depth, strongly connected by the cellular membrane already mentioned: it extended itself obliquely from right to left,

* Hist. Naturelle, tom. iv. p. 486, 487.

" and

42 *Of the contagious Distemper*

" and from the fore part backwards. The
" neck of this paunch was three feet eight
" inches in circumference." The use of these
fleshy fibres, or *musculi contractores*, is, by
purging up the bottom of the paunch, to
belch and throw up into the gullet and mouth
the food which is not sufficiently broke or
divided for digestion, that it may be chewed
over again, and made thinner by the *saliva*
and drink. The cellular membrane in a
sound state, when properly furnished with fat
in its cells, strongly connects the fleshy fibres
together, and thereby gives them the greater
firmness and strength of action; besides, it
forms these cavities by keeping those fibres
together, and by means of a large valve formed
by the membranous expansion, when these
muscles are in action, this stomach retains al-
ways some part of the thickest food in these
cavities, that they may always be in some
state of dilatation, and return to their concave
figure. Should this membrane be deprived
of its fat, and the fleshy fibres of their elasti-
city, by any putrid matter infecting the juices,
or by any other means, the action of this
viscus must necessarily be suspended or greatly
decreased, the consequence of which will
appear hereafter. The third *tunica* or coat is
the *vascular* one, composed of blood-vessels,
nerves, glands, and lymphatics. This is be-
set with papillæ chiefly about the upper parts.
The fourth coat, or *tunica villosa*, is a very
thin

thin membrane, which lines the whole cavity of this stomach, and covers the *papillæ* with its soft, downy, and exquisitely fine membranous filaments. It frequently comes off on the fingers when barely touched. These several coats, with arteries, veins, nerves, lymphatics, and glands, are common to all the four stomachs. I shall mention wherein they in some of the stomachs vary in their formation from the state they are seen in the others. In this first stomach the *muscular* coat is thinner than in the second and third stomachs; but somewhat thicker, on account of these contracting muscles, than in the fourth. From its form, position, and constituent parts, this first stomach seems designed by nature, first, for the reception of the food, whether grass, grain, meal, bran, &c. after it has undergone mastication, and of part of the drink; secondly, for the throwing up from time to time with ease part of these divided contents into the mouth, that they may be chewed afresh, and by the *saliva* and drink be rendered fluid enough to pass into the other stomachs; thirdly, by its different cavities and valves to retain part of its food, as the beast cannot chew much at a time, and this stomach by its bulk is calculated for the admittance of a great deal of food, no doubt that the beast may work or travel many hours without the want of provender.

II. The

44 *Of the contagious Distemper*

II. The second, called *κενούραλος*, *reticulum*, by Dr. JOHNSTON †, by the authors of l'Histoire Naturelle ‡, *le bonnet ou reticule*, by us the *honey-comb*, or *double tripe*, is seemingly a part of the foregoing stomach, being only separated from it by a long thick duplicated membrane; and, as the author of the above-mentioned Histoire Naturelle says, were it not for the different texture of this stomach, it might be deemed belonging to the paunch; whereas it is a distinct *viscus*, connected as an appendage to the paunch, and, from its internal surface, will appear designed for some particular uses; outwardly it has the shape of a cap inverted, and hanging flapped to the side of the paunch. The several coats of this stomach are thicker than those of the paunch; the outer one, formed by a prolongation of the *peritoneum*, is smooth, and strictly connected to the muscular coat, which is very thick. The vascular coat forms a sort of net or honey-comb work, whose *areolæ* rise about a quarter of an inch from the internal surface. The *areolæ*, or little cells, are divided by thin partitions, indented at the top with grooves from top to bottom, and placed in various directions, so as to give them the figure of quadrangular, pentagonal, hexagonal, or circular cavities. These *areolæ*, with their partitions indented and grooved,

† JOHNSTON, lib. ii. de quadrupedibus, cap. i. de ruminantibus cornigeris.

‡ Histoire Naturelle, tom. iv.

are every where beset with *papillæ*, and all are covered very exactly by the fourth coat or *tunica villosa*, which is particularly thin, and easily rubs off. The author of l'Histoire Naturelle says †, " That, notwithstanding the
" oddity and whimsical appearance the internal surface of the *reticulum* or *bonnet* affords to our view, it is by no means the
" most interesting part which chiefly should fix our attention in the examination of this
" stomach, but that the duct, canal, or *gutter*, (as he calls it) which is placed on the
" superior part of this stomach, and runs from the *æsofagus* to the orifice of the third stomach, is by far much more deserving our
" notice : this canal is eight inches long, its lateral edges are formed by a prominent
" duplicature of the membranes beset with *papillæ*. This semi-duct or canal is looked
" upon as a continuation of the *æsofagus*, also by contracting itself, and bringing
" both the edges close to each other, is thought capable of forming a closed passage, or an entire continued § canal, from
" the *æsofagus* to the third stomach."

With the author of l'Histoire Naturelle I admire this mechanism, but must beg leave

† Hist. Naturelle, tom. iv. p. 489.

§ The passage may be so close as to give no admittance to food, the thick sides and edges serving as valves; but, from the fluids seen in the honeycomb and paunch, there is reason to believe that fluids have a passage into those stomachs.

46 *Of the contagious Dissemper*

to differ from that learned naturalist in his opinion, that this duct or canal deserves and requires our attention far beyond the odd and whimsical appearance which the internal surface of the *reticulum* offers to view. As neither this gentleman, nor any other naturalist that I know of, has assigned any particular use for this stomach and its *areolæ*; I may be allowed to communicate my conjectures as they now occur. The situation of this *reticulum* or honeycomb on the right side of the paunch, whereby it is supported, its external appearance like a bag, its internal surface, with the different *areolæ* or cells, its joint action with the paunch, and the fluid contained; all induce me to think this stomach is designed by providence to receive and retain a sufficient quantity of water, or other liquid, to dilute the food contained in the paunch. The situation of the honeycomb on the upper part of the first stomach, its joint opening for the admission of the *œsophagus* or gullet, and the position of its smooth bottom upon part of the paunch, plainly shew, that, when by belching, the food is thrown up into the throat and mouth, at the same time part of the fluid contained in the *honeycomb* must be also thrown up. In swallowing, some of the chewed cud will fall into this stomach, and give the liquor the colour of the fodder, whether grass, grain, or other. The extent of this *honeycomb* is about a foot and half in length, and two feet
and

and a half in circumference, and will contain about two gallons.

The various compartments which form the *areola* or cells, and also the depth of these cells, demonstrate their being designed by the Creator, not only for the admission of a due quantity of water or other fluid, but also to detain some part of the fluid, whatever position the beast may be in. Moreover, it is very remarkable, that the horned cattle generally lie on their left side, so that the honeycomb then is supported by the paunch. As a proof of this observation, let any one examine the kidneys of those creatures. The left kidney will always be found the largest in a sound state: the side any creatures lies constantly upon or is mostly used in exercise, is always observed larger than the other. Thus I am induced to think that the horned cattle, who at most do not require to be watered above twice a day, are, by means of this reservoir, furnished with as much fluid as may be necessary to dilute their fodder, and quench their thirst when on the road, or in such countries where they are used for the plough or draught. When the paunch is filled with fodder, the semi-duct or canal in the second stomach is raised, the gullet becomes a continued pipe, and the beast drinking washes down the digested contents of the third stomach, or *manyfold*, into the fourth; and, after furnishing these stomachs, fills the honeycomb as a reservoir to supply

48 *Of the contagious Distemper*

supply the paunch whenever it casts up the cud for a second mastication. This seems to me an explanation of what use this odd and whimsical structure is, mentioned by the authors of l'Histoire Naturelle *; and, should I be so fortunate as to have my opinion approved by those learned gentlemen, and other naturalists, I dare flatter myself they will admire this noble mechanism to the full, as much as the semi-duct, since, doubtless, from their construction, they are both wisely formed for a reciprocal use.

III. The third stomach, by an extraordinary and still more surprising construction than the former, bears chiefly its name from what is observed within†. The antients called it *exiv*Ⓢ, *omasum*; the moderns also name it in French *le feuillet*, &c. § in England the *manyfold*, or *jeck*. Outwardly this stomach has some resemblance to a long melon by the divisions which are marked, is larger than the *boney-comb*, and lesser than the fourth stomach or *rennet-bag*. Internally this stomach is divided longitudinally by two semicircular concave folds formed by the vascular membrane, and beset with the *papille* already described, only they are larger and conical: these two have

* Hist. Naturelle, tom. iv. p. 456.

† Hunc excipit *omasum*, parte interiori cancellatum crustatum, magnitudine reticuli. JOHNSTON loc. cit.

‡ JOHNSTON de quadrupedibus, &c. lib. ii.

§ Hist. Nat. tom. iv. p. 490. Feuillet, Millet, Malle, ou Pleautier,

between

between them many other folds, some of a middling size; and, between these, others yet smaller. * Mons. D'AUBENTON has reckoned up ninety-six. These folds resemble fish-skin, and, from their laying one over another, have been compared to lattice-work, the leaves of a book, &c. whence arose the names just given. Between each of these folds is generally found some part of the fodder, which shows, that the use of this stomach is to grind chewed aliment, express the chyle out, and convey both into the fourth or last stomach. A narrow passage, and a strong valve, prevent the return of the nourishment back into the *oesophagus*. The *tunica*, or coats of this and the following, are the same with the two foregoing stomachs.

IV. The fourth and last stomach † Dr. JOHNSTON calls *ἄνυς-πάρ*, *abomasum* §; l'Histoire Naturelle: *la caillette*, *la franche-mulle*. In our language it is expressed by the names of *stomach*, *curd-bag*, or *rennet-bag*. The shape is like to a pear. It is the thinnest

* Hist. Nat. tom. iv. p. 491.

† Loc. cit.

§ *Abomasum*. The ancients were not very exact in their description of these stomachs. *Omasum* and *abomasum* they called those stomachs, which were eat as tripes; and instead of the third and fourth, should have sooner been applied to the first and second, which are our single and double tripe.

— Patinas coenabat omasi
Vills & agnini. HORAT. lib. i. epist. xv. ver. 34.

50. Of the contagious Distemper

of all the four, requiring less strength of fibres to prepare the chyle. The muscular fibres, which run lengthways, and those which, as so many wrinkles, intersect them transversally, form several cavities or *sinus*, wherein the food is lodged and expressed. Both at the *cardia* and *pylorus* there are circular muscular fibres, which contract, and, with the *valves*, prevent any return. In sucking calves, the *sinus* are found to contain expressed *curd*, which, from its acrid particles, after keeping awhile, is used in turning milk for cheese. Others, of late, prefer macerating some portion of this stomach: hence arise the appellations of *curd-bag* and *rennet-bag*. The inside of this stomach is lined throughout by the *tunica villosa*, which is of a very delicate texture, and besmeared with a thick *limy mucus* discharged by the glands.

From what has been related, it appears, that the *rumen* paunch, or *curd-bag*, first receives the fodder after mastication, and, by an easy vomiting, called *rumination*, throws up the *curd* to be chewed afresh; that the *reticulum*, or *honeyscomb*, contains water for the dilution of the food in its course, that from a pappy substance, like unto mashed spinnage, the *grass*, &c. is expressed still more in the *manifold*; and lastly, that in the *curd* or *rennet-bag* it acquires the consistence of a thick cream, separated from the *feces*, which are conveyed off by the *intestines*.

Here I cannot avoid admiring the stupendous wisdom of the Supreme Creator, who has so excellently formed every thing for the execution of the purpose it was intended for. The horned cattle, designed chiefly for food, and but for very slow draught, are amply provided with large cavities, the stomachs, to store up much fodder and water, that they may be the better enabled, by the juices extracted from their fodder, to furnish us plentifully with milk, and support us by their flesh. How also, by their make, they carry a sufficient quantity of water to quench their thirst in a day's journey or work, requiring only to be watered twice a day. Examine now the inside of a horse: his stomach is small, in comparison with other quadrupeds of his size; and the only one he has, is sufficient to contain the provender which will support him during his labour. The teeth and the *saliva* break and soften his food, whether grain or grass, to such a degree, that, with the water he drinks, digestion is quickly performed in the stomach, which is soon emptied. Had this creature as many stomachs as the horned cattle, and of the same extent, the design of the Great Creator would have been frustrated; for the continual pressure of all that weight, contained in the several stomachs, against the *diaphragm*, and consequently the lungs, would never have permitted the free exercise of the organs for

52 *Of the contagious Distemper*

respiration. A horse, then, would have had no more speed than a cow; and daily experience testifies, that riding a horse swiftly, after his stomach is extended by drinking, brings on diseases of his lungs, which are not easily removed.

Moreover, that so large a creature should not suffer by a too speedy digestion, a particular mechanism is discovered in the structure of the *colon*, peculiar only to this animal * †. The *colon* has four cavities, or bags, of different sizes, divided from each other by strictures, and a contraction of the intestine; so that this natural widening of this gut, and its two curves, help to fill up the cavity of the *abdomen*, containing a large quantity of *feces*, from whom the lacteals absorb what fluid they are to secrete. The inferior part of the *colon* is furnished with small cavities, contracted by strictures, which mould the excrements into *scybala*. The extent therefore of the *colon*, its cavities, and situation, serve to assist the stomach, and make amends for its smallness; also prevents a weight laying against the *diaphragm* and lungs, which would obstruct respiration, whenever a horse quickened his pace. If the stomach of a horse be not so formed as to be emptied by vomiting, on account of the oblique insertion of the *æso-phagus*, the sphincter which compresseth it,

* Hist. Naturelle, tom. iv. p. 308—315.

† Gibson's Farriery.

and

and the duplicature around the *cardia* †: whoever calls to mind the structure of the four stomachs of a horned beast, just described, will plainly see not only the impossibility of clearing *all* the stomachs, even in other diseases where the hardened *pabulum* is not to be met with; but the great danger there is of irritating and inflaming the inner coats of these stomachs, by drastic purges or stimulating vomits.

One observation is unavoidable, that medicines for that intent, given in a solid form, will first be only received into the *ramen* or paunch, and must follow the same slow progress through most of the stomachs, as their food does. Secondly, liquid purges may be partially distributed in all the stomachs, and rather irritate than have the desired effect.

I hope this anatomical digression will not be disagreeable to the reader. I will now lay before him what was observed, upon opening the dead carcasses of beasts which died of this contagious distemper.

All the carcasses that were opened, appeared outwardly extenuated by the violence of the scowering. Upon opening the skin, much stinking air rushed out, with sometimes a purulent and sanious discharge *. The vessels of the brain were turgid, and filled with blood of a very red and loose texture, the

† Hist. Naturelle, tom. iv. p. 308—315.

* RAMMAZINI de Boum contagione epid. p. 438.

54 *Of the contagious Distemper*

ventricles filled with water. The * membranes of the nose, the glands †, the whole extent of the *frontal sinus* ‡, the pith of the horns, highly inflamed, ulcerated, and full of small abscesses; the same appearance in the mouth, and about the glands of the throat. The lungs inflamed with livid sphacelated spots, and here and there loaded with *hydatides*; and the cellular texture frequently distended with air. The heart large, flabby, and dark coloured, containing in its ventricles clots of black blood, of a very loose texture, without *serum*; the fat about it, of a bright yellow. The liver large, its blood and biliary vessels fully extended with dark fluid blood, and very deep coloured bile; the substance of the liver so rotten, as to separate on the least touch. The gall-bladder stretched to a great size, and full of greenish bile; the *œsophagus* ulcerated in some. The *rumen*, chd-bag, or paunch, distended with air, flabby, and containing a hard large substance §, like a dried turf, and consisting of fodder, hardened to that degree. Several marks of

* RAMMAZINI de Boum contagione epid. p. 458.

† LANCISI de Bovilla peste, part. iii. caput. II.

‡ Gent. Mag. vol. xvi. p. 652.

Dr. MORTIMER, having never seen any cutaneous eruptions, boils, nor carbuncles, concludes, in the same page, that the disease is *evidently* inflammatory, without contagion. Now RAMMAZINI tells us, p. 462, that not one of the cattle recovered, but such as had pustules broke out upon the skin.

§ LANCISI, *ibid.*

inflam-

inflammation and gangrene appeared on all the stomachs. The *reticulum*, or honeycomb, had no fluid in it, but some pappy fodder: its *areolae* were quite relaxed and collapsed. The *manyfold* contained much of that dried fodder between its several folds, and clung to their sides. The curd or *rennet-bag* was empty, but within highly inflamed, and gangrened in several places: all the intestines empty, and beset with red and black spots. The kidneys and bladder large, without urine; the kidneys of a loose texture, easily torn. The flesh in some was livid, in others of a lively red, but soon turned green. The fat that remained, was of a bright yellow all over the body. In such cows as were with calf, the *uterus* was gangrened in several places, and the waters which surrounded the *fetus*, or calf, stunk intolerably. In short, every carcass gave sufficient evidence of a general putrefaction: they only differed from each other in this particular, that the virulence of the disease appeared sometimes to have fixed itself chiefly on one vital part; in other carcasses it was found in a different part, and frequently in more places than one.

Upon the whole, it is obvious, that this disease ariseth by a pestilential *fumes*, whose *miasmata*, conveyed by the air, or any other means, insinuate themselves into the fluids of the horned cattle*, either by the organs of

* SYDENHAM de Morb. Acut. cap. i.

56 *Of the contagious Distemper*

respiration or deglutition; that not only they vitiate the fluids by the ferment they produce in them, but also relax the solids, so as to suspend the action of the *primæ viæ*, and obstruct the vital functions; that unless Nature overcome this dreadful assailant, maintaining the strength of the solids, and expelling the morbid matter through the skin *, which is visibly her chief intentions, by those abscesses found under the integuments: nay, unless she be assisted by art in many cases, the beast must fall a sacrifice to the distemper. But, on the other hand, if Nature be supported in her attempts to exclude this poisonous matter, and the methods pointed out by her be attended to, and followed, there will be the same reason to expect success, as in the management of the small-pox. Yet let it be understood, that since all do not recover of the small-pox, tho' never so well taken care of, so in this distemper all will not be cured, notwithstanding the utmost diligence; it having been observed, that the fattest cattle, cows with calf, and young calves, were in the greatest danger, through the laxity of their fibres.

Before I proceed, in the next chapter, to lay down the method of cure, I will endeavour to reconcile the different opinions that have been entertained of this disease, with regard to the inflammation and infection attending it.

* HUXHAM on Fevers.

† By an inflammation is generally understood a fullness and turgency of the blood-vessels, whereby a stagnation is brought on, and, unless speedily removed, by emptying the vessels, which is called derivation, revulsion, or dispersion, terminates either, in the rupture of the vessels and fermentation of the several extravasated blood and fluids in an abscess, commonly expressed by suppuration; or, the vessels having lost their elasticity, and the stagnation still increasing, in which case all sensibility, heat, and circulation are no more to be found, it terminates in a gangrene.

Whatever can wound and irritate the nervous fibres internally or externally, will produce the first; old age, cold, and relaxations, bring on the latter. With regard to internal diseases, there is no doubt but that all those of a contagious kind are attended with inflammation, more or less, according to the constitution of the subject infected, whether sanguine or cacochymic, young or old, and according to the degree of infection. In sanguine and robust subjects the putrid *ferment* increases the circulation of the blood, whose texture may already be much divided by violent exercise, or any other inflammatory cause. In these also, the elasticity* of their fibres affords a great degree of resistance, and constantly endeavours to expel the assailant, until

† LE DRAN. Vide infra. 10 v. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842. 843. 844. 845. 846. 847. 848. 849. 850. 851. 852. 853. 854. 855. 856. 857. 858. 859. 860. 861. 862. 863. 864. 865. 866. 867. 868. 869. 870. 871. 872. 873. 874. 875. 876. 877. 878. 879. 880. 881. 882. 883. 884. 885. 886. 887. 888. 889. 890. 891. 892. 893. 894. 895. 896. 897. 898. 899. 900. 901. 902. 903. 904. 905. 906. 907. 908. 909. 910. 911. 912. 913. 914. 915. 916. 917. 918. 919. 920. 921. 922. 923. 924. 925. 926. 927. 928. 929. 930. 931. 932. 933. 934. 935. 936. 937. 938. 939. 940. 941. 942. 943. 944. 945. 946. 947. 948. 949. 950. 951. 952. 953. 954. 955. 956. 957. 958. 959. 960. 961. 962. 963. 964. 965. 966. 967. 968. 969. 970. 971. 972. 973. 974. 975. 976. 977. 978. 979. 980. 981. 982. 983. 984. 985. 986. 987. 988. 989. 990. 991. 992. 993. 994. 995. 996. 997. 998. 999. 1000.

* BAGLIVI de Fibra motrice, cap. vi. & vii.

58 *Of the contagious Distemper*

it has forced it out through the emunctories, or is obliged to yield to the overpowering juices, tainted, and rendered more and more putrid and relaxing, the more they are blended and mixed with the contagious *miasmata*. Then the blood becomes less fluid, the elasticity of the vessels is impaired; obstructions and stagnations come on.

The fever, which arises in the first stage of this distemper, brings on those obstructions which cause an inflammation: in the second stage, this inflammation should abate by a free perspiration or abscesses; and totally disappear in the last stage, by the discharge of the morbid matter.

The inflammation must be attended to, and kept within bounds; but it never should be so violently attacked as other inflammatory diseases. Persons, 'tis true, are much oftner lost in pleurifies, ardent fevers, and inflammations of the intestines, for want of repeated evacuations, than by lessening the quantity of the blood: but then it is worthy notice, that the stagnation causing these inflammations coming suddenly, and there being no putrid ferment to relax the coats of the vessels, the elasticity increases by degrees, as the *impetus* of the agitated blood forces against the sides of the vessels. Thus the motion and heat increases, the fluids grow thicker, the vessels more turgid, the obstruction greater; and, unless the quantity of the blood be considerably

ably decreased, and the vessels disgorged, a rupture of the vessels, and consequently an abscess, will follow; or else a total stagnation, ending in a gangrené.

The stagnation, which causes the inflammation in this contagious disease, cannot terminate in induration*.

Thus it appears, that this distemper is equally inflammatory and contagious with the small-pox, and is to be treated according to the predominant symptoms; but as † CELSUS has long since elegantly observed, " Diseases are not cured by force of words, but by remedies." I, therefore, shall next consider the method which it may be the most advisable to follow.

* LE DRAN, Traite d'Operations de Chirurgie, chap. de l'Inflammation, p. 12.

† Morbi non eloquentia, sed remediis curantur. CELSUS in prefat. lib. i. p. 10.

60 *Of the contagious Distemper*

CHAP. V.

Of the method of cure.

THE nature of the disease directs the intentions of cure, and every different stage of the distemper points out the several curative indications *.

The analogy between this distemper and the small-pox, will afford a rational process, and RAMMAZINI's directions authorizes this practice †.

Those who treated this as an inflammatory disease, and some who acknowledged it to be infectious, have recommended bleeding in large quantities ‡, and repeatedly §. In this they followed the rules of practice confirmed and approved by experience, in the treatment of inflammations.

* Decursus etiam horum phaenomenon rite observatus docet nos, quo auxilio, tempore, ordine, modo, & via utendum sit, ut causa morbi proxima in corpore humano, corrigi vel expelli queat. BOERHAAVE Instit. Med. ver. 1148.

† Crediderim itaque in curatione hujus malignae febris, ea methodo procedendum quae a bonis medicis servatur in curanda variolosa puerorum febre, distinguendo tempus ebullitionis, a tempore expulsiōis. RAMMAZINI de contag. Boum epid. p. 460.

‡ Gent. Mag. vol. xvi. p. 121.

§ Ibid. p. 650. vol. xvii. p. 30.

|| LEONAR-

|| LEONARDUS BOTALLUS, and SYDENHAM §, were their guides, who bled freely in pestilential cases; but these sagacious and truly honest physicians have distinguished the stages wherein blood was to be drawn; and if they be attended to, it will appear, that they did not mean to direct bleeding at all times, and in all cases; but have expressly noted, that when critical eruptions are formed, bleeding is not only useless, but prejudicial *, especially when the fever and other symptoms abate.

Bleeding, therefore, will be found necessary only when the inflammation is so considerable, and the fever so high, that nature is obstructed, and cannot expel the morbid

|| LEONARDUS BOTALLUS de curat. per sang. miss. cap. v. & vii.

§ SYDENHAM de Febre pestilentiali, anno 1665, 1666, p. 83.

* Erit igitur inutilis venæsectio in exanthematis, & aliis dictis abscessibus erumpentibus aut paulo post, dum febris, & alia mala accidentia (siquæ sint) solvi aut mitescere videbuntur; significat enim id, naturæ vires esse morbificâ causâ superiores: quare ibi artifex animadvertere debet, ne naturæ conatus rectè inchoatos imprudenter infringat. L. BOTALLUS, cap. v. p. 146. Et infra, cap. xx. p. 234, ait.

* Verum etsi dicti omnes morbi sua natura opem ex missione sanguinis postulent: non tamen ea utilis est omni tempore.

* Apparente autem jam tumore, celebrata venæsectio, a peripheria ad centrum trahat, motui naturæ, qui sit a centro ad circumferentium, inducit motum planè adversantem. SYDENHAM loc. cit. p. 81.

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62 *Of the contagious Distemper*

matter; and, whenever such symptoms are apprehended, prudence will require bleeding to prevent this coming on, according to the constitution, strength, and age of the beast.

Blisters have been recommended instead of rowels and setons. The acrimonious salts of the *cantharides* would only serve to increase the fever; could their application on the skin of these creatures be effectual? The viscidities which follow the first seizure of the disease, is removed by a moderate and timely bleeding, and by the fever in time of despumation, as SYDENHAM names it, or of ebullition, so called by the *Italian* authors: in this case, the texture of the blood is sufficiently broke, by the course of the illness, as appears by the grumous blood found in the carcasses, which blood is of a loose texture, the violent scowrings having carried off the serous fluid part of the blood. Blisters are inconsiderable by their discharge, not easily to be kept on the hairy coverings of beasts, and very prejudicial if they encrease the fever.

An absolute impossibility of vomiting the horned cattle has been demonstrated in the chapter on Dissections; as also, what irritation an attempt of that sort, or a rough drastic purge, must inevitably occasion in their several stomachs. Should necessity require the unloading the *primæ viæ*, lenient means must be used; and it may not be improper to

re-

remark here, that though the stomachs and intestines of those creatures may lose their digestive faculties by this putrid distemper, yet they are not overloaded, nor stuffed up with such acrimonious *saburra* as the first passages in the human body generally are. The reason is plain, their food is simple, and has neither the putridity nor acrimony of the human. Their *faeces* also have not so high a degree of putrefaction. All the vomits and purges in the world cannot remove the caked *pabulum* in the *paunch*. Dilution and strengthening the fibres of that stomach must enable it to digest, or rather, when once duly separated, to belch up the fodder, that it may be chewed afresh for digestion.

The use of *nitre* in the first stage may contribute to lessen the degree of inflammation, but given in any other stage it will check the progress of the *exanthemata*, or pustules, and prevent suppuration; sometimes bring on a scowering, consequently a reabsorption of the putrid matter from the abscesses, and either kill the beast or expose it to a *marasmus*.

Campbor, though an excellent medicine, in acute diseases, especially when dissolved with acids, I did not direct; chusing to prefer such remedies as were cheaper, easier to come at, and not so disagreeable to the stomach.

Chalk;

64 *Of the contagious Distemper*

Chalk, or *testaceous powders*, I made no use of, first, because, since the learned and accurate Dr. PRINGLE * has so clearly proved the *septic* quality of *chalk* and the *testacea*, they are seldom given in putrid fevers, lest they should increase the putrefaction. Secondly, as they would only serve to clog up the *primæ viæ*, without answering the intention, for which medicines of another form were better adapted. The same reason made me prefer medicines of a liquid to those of a solid form.

White vitriol, *mercurials*, and *antimonials*, have proved equally prejudicial, through their irritating quality, as *oils* and *balsamics*, by increasing the relaxation of the *primæ viæ*.

Having considered the inutility, nay detriment, arising from the administration of improper medicines, I shall next lay down the particular method which I directed.

The Cure.

Immediately upon the first appearance of the distemper, as mentioned in the foregoing chapter of the symptoms, the beast is to be put into a barn or stable, well littered; which litter must be thrown up morning and evening, and changed for fresh straw every day; the place the cattle are housed in, should be

* Dr. PRINGLE on *septic* and *antiseptic* substances, experiment xxiii. in the appendix to the observations on the diseases of the army.

spacious; and they must not be crouded, that the air may be neither too warm, nor too offensive by the steams of the infection. In warm weather, the stable or barn-door might be left open half an hour; an opening of about a foot square should be made at the top of the barn to the southward, and one at the bottom to the north-west, in order to give a free passage to the foul air, and entrance to fresh; but the cattle must be so placed out of the course of the air, that they may not receive cold: shutters may be contrived to let down at night, or in a cold day. Bunches of sweet-scented flowers, or aromatic herbs, may be hung in the stable. A thin woollen, or a coarse linnen cloth, should be fastened on the bodies of distempered cattle, rather loose than too tight, leaving always sufficient room for a steer to stale, and not to press the bags of a cow.

If the beast be full grown and fleshy; if a cow, very big with calf, and of such colour as denote strong fibres, then take away two quarts of blood from the neck. From a strong yearling calf, one quart, and so in proportion to age and strength; but neither weakly calves, nor poor thin cows, especially white ones, are to be bled so much, if at all.

The beast must then be washed all over with warm water and vinegar, to clear the hair from filth and insects, and rubbed quite dry with a cloth, or straw. The steams of

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66 *Of the contagious Distemper*

hot vinegar and water, with aromatic herbs in it, may be placed in the stable, to revive the cattle. During the whole illness, the beast must be rubbed a quarter of an hour, both morning and evening, with a dry woollen or linnen cloth, or straw, to promote perspiration. The cattle are so sensible of the relief this rubbing affords them, that they stand up with great satisfaction all the while their keeper is rubbing them. They may also be curried the three first days, before the pimples come out; and the bags of a milch cow should be anointed morning and evening with warm oil, to preserve the milk; taking care to cover the bags from cold, and to draw off any fullness of milk, which might occasion an abscess.

As soon as conveniently can be done, and the sooner the better after bleeding, let a rowel be made in the dewlap, in the following manner. Take a skain of hemp, tow, or twisted packthread, a foot long, and as thick as a man's thumb; let a hole be made in the dewlap, and this rowel passed through it, so that the ends may hang out at about three or four inches from one another. The rowel is first to be greased with hog's-lard, and not to be moved of twenty-four hours. To prevent cold coming to the rowel, put over it a plaister of tar and hog's-lard, spread upon linnen or tow.

The

* The next morning dress the rowel thus: draw first one end, then the other backwards and forwards, greasing that part of the skain which passes through the wound with an ointment made of the best *Venice turpentine*, and a sufficient quantity of yolks of eggs mixed together, to the consistence of a soft ointment. In the second stage of the distemper, the rowel will swell, and then run; if the flux of matter be considerable, and the part much swelled, it will be proper to put over the swelling a pultice of bread and milk, with a little hog's-lard, and dress the rowel twice a day, till the swelling be abated. The rowel should be kept in at least a month after the recovery of the beast, not only that all the putrid matter may be discharged, but to prevent such disorders as arise from a fullness of the vessels, generally observed upon the recovery from acute diseases, and owing to a quick digestion, and speedy secretion of *chyle*, whereby the quantity of blood is much increased.

Should the beast be hot, hang down its head, breathe with difficulty after the bleeding, dung hard, and the skin feel tight and thick, which is called being *hide-bound*, then it will be very proper to give a gentle cooling

* Rowelling in this manner is preferable to pegging, and taking a piece out, as directed by COLUMELLA, lib. vi. cap. v. the matter being less liable to be confined through cold, when the wound is guarded from the air.

68 *Of the contagious Distemper*

purge in this first stage. The following may answer the purpose.

I.

Take four hands-full of bran, boil it in five pints of spring-water to two quarts; then strain the liquor, and dissolve in it two ounces of lenitive electary, and half an ounce of Glauber's salt, which give to the beast luke-warm.

An hour or two afterwards may be given a draught of water-gruel, in quantity about three pints or two quarts.

When the beast has voided the hardened dung, by this purge, or, if it should not have wanted purging, the following drench is to be given.

II.

Take of madder-root three ounces; of turmeric and * horse-radish-root, each one ounce; of fenugreek-seeds, bruised, two ounces; of † chamemile-flowers, dried leaves of feverfew, rue, and sage, of each one hand-full. Boil them half an hour in a gallon of small ale, well hopped, to three quarts; then strain the liquor, and give the beast three pints

* See Dr. PRINGLE's experiments, N^o. xiv. and xv. on the antiseptic quality of horse-radish-root, and chamemile-flowers.

† Dr. HALE's hæmæsthetics, exp. xvii. on the astringent quality of these flowers.

in

in the morning, and the remainder in the evening.

No dry or solid fodder is to be offered, till the beast cheweth the cud. Between these drenches, a quart or two of vinegar-whey must be given frequently in the day, to dilute the hardening fodder, and strengthen the coats of the stomach. The vinegar-whey is thus made.

III.

Take equal quantities of milk and spring-water, and, when boiling, pour in a sufficient quantity of distilled white-wine vinegar, to turn the mixture; then strain off the whey, and always give it luke-warm.

The three first days elder-vinegar will be most suitable, and afterwards I would prefer garlic vinegar; but whether with or without these, the vinegar used must be distilled, that it may be the purer, and free from dregs or insects.

* The beast may also drink hay-water, which is an infusion of hay, made by pouring boiling water on cut hay, and letting it stand till the water be brown, like bohea-tea, or beer-wort. In this case I would recommend the adding chamæmile-flowers sufficiently, only to give the liquor a pleasant bitterness. This hay-water is not instead of the vinegar-

* See Gent. Magaz. vol. xx. p. 14.

70 *Of the contagious Distemper*

whey; tho' both are proper, yet the whey, besides being very agreeable to these distempered creatures, is of greater efficacy in this putrid disease: therefore both hay-water and vinegar-whey are to be used alternately.

I prefer vegetable to mineral acids for these beasts, on account of the first being more at hand, not corrosive, less sharp and irritating; there requiring no other exactness in the mixing them, than taking care not to make the hay-water, or any other mixture, too sour. † The authors of *l'Histoire Naturelle* tell us, that the horned cattle are naturally so fond of wine, vinegar, and salt, that they greedily eat up a dressed sallad. And I observed, that the beasts I saw, so far from requiring any force to get the medicines or whey down, regularly looked for them, and licked up even the last drop they could get out of the pail.

Great care must be had, twice or thrice a day, to cleanse the mouths, barbs, and nostrils of the distempered cattle. The following mixture was made use of.

IV.

Take of Malaga raisins and figs, each two ounces; mustard-seed, bruised, half an ounce: boil them in three pints of milk and water to a quart; then add two ounces of honey of roses, and half an ounce of spirit of salt ammoniac. With this mixture let the mouth,

† *Hist. Naturelle*, tom. iv. pag. 467.

barbs,

among the Horned Cattle. 71

barbs, and nostrils be washed and cleansed, by means of a brush or sponge. Continue this till the ulcers about the nose and mouth begin to scab; then washing with sage-tea, sweetened with a little honey of roses, and made tart with vinegar, will be sufficient. Should the acrimony of the disease be so severe, and the blood be so much broke in the progress of the disease, that the ulcers bleed, then to the sage-tea should be added enough powdered roch-allum, to give the tea a considerable roughness.

On the fourth day, if the beast be heavy, dull, shivering, no pimples or knobs arise, and a purging be coming on, the following drench must be given at about eight in the evening, and repeated three or four nights, as occasion requires, agreeable to * SANCTORIUS; who advises *medicines which promote perspiration, to carry off a looseness.*

V.

Take of Virginia snake-root, contrayerva-root, chamæmile-flowers powdered, of each half an ounce; Venice treacle, six drams: mix all these in three pints of vinegar-whey, and give the drench luke-warm.

Let a person sit up all night with the beast; and give it frequently a quart of vinegar-whey:

* *Profluvium alvi tollitur iis, quæ perspirationem augent.*
SANCTORII Aphorismi. sect. I. art. xcii.

72 *Of the contagious Distemper*

Mr. † MONTGOMERY furnishes six instances, out of seven, which were cured by Venice treacle; and tells us plainly, that the seventh was killed by giving a lump of tar with oil of turpentine, which checked the operation of the Venice treacle, by clogging up the stomach.

The former drench, N^o. II. directed to be taken twice a day, is to be given early in the morning, and about three or four in the afternoon, that it may not interfere with the Venice treacle drench. Hartshorn drink may be given, a quart at a time, frequently in the day.

But when a mortification is apprehended, by the dark and relaxed appearance of the mouth, the coldness of the beast, the black fetid dung, insensibility, sanious discharge from the mouth and nose, thickness of the eyes, the bark must then be instantly given.

Dr. WALL §, guided as I was by the analogy there is between this contagious distemper, the small-pox, and Dr. FOTHERGILL's account of the sore throat, attended with ulcers, recommends in his own name, as also in Dr. CAMERON's, and of the other physicians at WORCESTER, the administering the bark in this disease.

The doctor directed "one ounce of Jesuits bark, finely powdered, to be given in a decoction of one ounce of myrrh, boiled in

† Gent. Magaz. vol. xviii. p. 282.

§ Gent. Magaz. vol. xviii. p. 71.

“ three quarts of water and vinegar to half
“ the quantity; and to be repeated every four
“ hours.” The drench I prescribed is as
follows.

VI.

Take of oak-bark, two ounces; Peruvian,
otherwise called Jesuits bark, myrrh, each one
ounce. Let the barks be both beat to a coarse
powder, and the myrrh bruised. Then put
the barks into five pints of spring-water, and
boil gently till the quantity decreases to two
quarts: then add the myrrh, and let the
whole boil away gently to three pints. Strain
the decoction through a coarse linnen cloth,
and add two drams of roch-allum powdered.
Let the beast have this drench luke-warm
every four or six hours, as occasion may re-
quire.

A half-pint of red wine lees may be added,
if the purging be considerable, and the beast
weak. Vinegar-whey, oatmeal-water, and
hay-water, with chamæmile-flowers infused,
and acidulated with vinegar, are to be given
in the intermediate times.

Holding the mouth and nose of the beast
over the hot steams of water, vinegar, tinc-
ture of myrrh, and honey of roses, and con-
veying those steams into the throat by means
of a large funnel, will answer the intentions;
it being very difficult, in this bad state, to
keep

74 *Of the contagious Distemper*

keep up the head long enough to cleanse the mouth and throat.

Nature frequently deposits the morbid matter in the horns. If after the fourth day, when the violent symptoms abate, the head still is hung down more on one side than the other, sometimes the eyes and nose run much, and a heat is felt in the horn, while the body feels temperate, there is reason to think an abscess is formed in the horn; then let the horn be bored about two or three inches below the tip, without wounding the pith, and bore in the same manner on the opposite side about half an inch lower: cover these openings with a linnen cloth dipped in oil, and a piece of soft leather tied over, to prevent the air rushing in, and watch if any matter maketh its way through these openings, in which case the discharge must be encouraged; and if these openings be not sufficient to let out the matter, no danger will follow the making more holes, even at the root of the horn, with the former caution, if this be found to be the depending part of the abscess. There are instances of all the horny part having been thrown off, and the beast has recovered, which it otherwise might not, if the matter pent up in the horn had been absorbed, and circulated into the blood, occasioning such relapses as shall be mentioned hereafter. I have had the cattle bored in the first seizure, without any bad

bad effect, tho' I see no absolute necessity for this boring, before the time of suppuration.

○ Abscesses in the nose may be broke and discharged by sternutatories. *Asarum* leaves, dried and powdered, has been used successfully for that purpose at NORWICH *.

In the last stage, on the appearance of an *emphysema*, a swelling or puffing up of the skin, distended with a thin purulent sanies, and putrid air, as mentioned already, and which is the last effort of Nature to throw off the morbid matter; it will be proper to open the swelling, whether on the back, lengthways, or under any other part of the skin, according to the direction of the limb. The matter must be all let out by a sufficient incision, and the cavity filled with pledgits of tow, dipt in an ointment made of turpentine, yelk of egg, and myrrh powdered; over which a poultice of oatmeal and stale ale, sprinkled with spirits of wine, is to be applied very warm, and renewed twice or thrice a day. These dressings are to be continued till the ulcer digests properly, and then must be treated as other suppurating abscesses usually are.

After the *crisis* takes place in this and all putrid fevers, Nature generally discharges itself of part of the morbid matter, by unloading the intestines of the *feces*. In some cases a scowering ensues, which is not to be hastily

* See Gent. Mag. vol. xviii. p. 75.

76 *Of the contagious Distemper*

stopt, though diligently watched and restrained, lest it weaken the beast too much. The following purge may be given, to cleanse the stomach and bowels.

VII.

Take of rhaponticum, or monk's rhubarb, one ounce; or of the best Turkey rhubarb, half an ounce; of sena, half an ounce; of liquorice-root sliced, and anise-seeds bruised, each one ounce. Boil these in two quarts of small ale, gently, to three pints; then strain the liquor, and give it the beast.

Let the beast drink water-gruel lukewarm, and be kept on dry meat, tho' sparingly; and at night give an ounce of electary of scordium, commonly called diascordium, in a quart or three pints of small ale warm.

But if, after the *crisis*, the beast is costive, and the skin be dry, harsh, and tight on the flesh; dunging may be procured, by giving in the evening a mash of bran, with a handfull of beans bruised, and an ounce of Epsom salt. However, I cannot avoid recommending the greatest exactness in observing that the *crisis* is over; for the least laxative medicine, or opening food, given at the *acme*, or height of the disease, and consequently in the former stages of expulsion and maturation, will certainly bring on a scowering, attended with fatal consequences, or at least very difficult to
be

be removed. An instance of this will be produced hereafter.

VIII.

Take of aloes, anise-seeds bruised, rhaponticum, or monks rhubarb, of each an ounce; or, instead of the rhaponticum, of the best Turkey-rhubarb, half an ounce; senna, and liquorice-root sliced, each half an ounce. Boil all these over a slow fire in two quarts of small ale to three pints: strain the liquor, and add half an ounce of soluble tartar, and give it warm to the beast.

When a purge has worked briskly, it will be proper at night to give the beast a quart of small ale warm, with a moderate quantity of spices, and bread crumbled in it.

Milch cows, recovering from the distemper, are not to be violently purged, especially if the owner be desirous the milk should return; to effect which, the beast must only be purged with the gentle drench already directed, N^o. VII. and on the following days and intermediate ones from the purging. A quart or two of milk-pottage three or four times a day, together with good sweet hay, if in winter, and an hour's grazing in dry pasture morning and evening, if in summer, will be the likeliest method to recover the milk; beans, peas, and chaff, being too hot and dry, will not answer the purpose. The beasts must also be

78 *Of the contagious Dissemper*

allowed a sufficient quantity of warm water; or water-gruel, to drink as much as they chuse. It being only for want of proper fluids and good *chyle*, that the blood-vessels and the glands of the duggs do not secrete the milk as usual: these blood and secretory vessels being all along in a state of relaxation, whenever the tone of these vessels is recovered, and they are supplied with proper fluids, milk is produced anew. For the ease of the beast, and to encourage a flow of milk, the duggs should be washed twice a day with warm milk and water, or water with bran boiled in it, and clothes dipped in such warm liquor should be applied to the duggs about a quarter of an hour each time. To prevent any inconvenience from too much milk being in the bag at once, care must be taken, as soon as the bag appears to swell, to milk the cow; beginning by drawing the beast moderately, and continuing morning and evening by degrees, till the milk flows as usual. This method will secure the beast from a stagnation of milk in the duggs, and of course from abscesses forming in them.

In winter time the cattle, upon recovery, should not be turned out at once into the pasture-grounds, let them be never so dry: towards the middle of the day, in fair weather, turning them out two hours, and then bringing them in again, will gradually use them to the open air. In summer, morning and even-

ing will be the most suitable time; for the heat of the sun, or excessive cold, may bring on other disorders. There are two, which, for want of this attention, many have fallen into, and have been lost. I mean a *vertigo*, dizziness or swimming of the head, and a *marasmus*, or consumption. The *vertigo*, giddiness, dizziness, or swimming of the head, so well described by Mons. DE LA METTRIE *, and which it would be unnecessary here to treat of at full length; is, in the case before us, owing to a relaxation of the blood-vessels and nerves, and also to a fullness of blood, from the quick secretion of the juices into *chyle*, and the increase of blood; whenever therefore the beast, turned out to graze, hangs down its head, the force of the circulation of the blood in the vessels of the eye, particularly on the inner coats, the *uvea* and *choroides*, is such, that it produces vibrations and undulations on the *retina*, whereon the object is represented: this agitated motion varies the distance and form of the object, creates a confusion in the nervous system, so that the beast, affrighted, cannot direct its motion, but frequently mistakes the way, and runs headlong to its destruction.

Cattle have often been found drowned in ponds, fallen into ditches or precipices, there killed or maimed, from no other cause but this *vertigo*; nay, their keepers have been

* Traité du Vertigo, *passim*.

80 Of the contagious Distemper

witnesses of these accidents coming on so suddenly, that they were not at hand soon enough to prevent the mischievous consequences.

To avoid this disorder, and likewise a frenzy, or *delirium*, which cold, by obstructing perspiration, and increasing the circulation of the blood might occasion, the first remedy I would propose is drawing two quarts of blood from the neck of the beast, before it be turned out to grass; not to put it out till a week after the *crist*, and then a few hours at a time first, and only in the day-time, especially if the season be wet and cold, and the pasture in low and marshy grounds. All the while the beasts are out, a herdsman should be with them, to hinder their eating much grass, or hanging their heads down long together. It would be far preferable to begin by tying them up in the open air, and feeding them on dry hay in a close, making them walk also to and fro gently by way of exercise, and rubbing them down morning and evening with straw.

The following drench, given morning and night during a week, will strengthen and nourish the beast.

IX.

Take of sage, rue, and rosemary leaves dried, each one handfull; four cloves of garlic bruised: boil these in two quarts of small

ale

ale to three pints; then mix two eggs into the strained liquor, and give it warm.

Eggs and wine have been recommended by †COLUMELLA for diseased horned cattle. Our small ale, well hopped, will answer better the purpose of our climate than wine. Their small ITALIAN wine was well adapted to that warm climate, where the cattle must perspire more than in these kingdoms. Our small ale is both strengthening and nourishing, and also to be had at a much more reasonable price than even bad wine could be bought for.

Milch cows will be less liable to this disorder, if constantly milked twice a-day; and with dry-fodder, bulls, oxen, young heifers, and calves, will require gentle and moderate exercise.

A *marasmus* is a wasting or consumption of the beast, whereby so far from thriving by all the nourishing fodder it takes, that it daily grows leaner, and dies quite emaciated in a month or two.

Sometimes a husky cough, wheezing, and shortness of breath, at other times a constant scowering, accompany this disease. The first may be occasioned by infarction or obstructions, and may produce abscesses in the lungs; the latter, by remains of the sharp acrimonious and putrid matter lodged in the bowels. In both cases, if the beast be hot, and not

† Loco citato

32 *Of the contagious Distemper*

very weak, take two or three quarts of blood from the neck, according to the strength of the beast, and to be repeated, if occasion requires.

For the cough and shortness of breath, let the beast have a drench, morning and evening, of three pints of tar-water; in which two eggs, beat up, be well mixed. Mashes of scalded bran, common barley boiled, barley-water, milk-pottage, and sweet hay, are to be frequently given in the day-time, and all the liquors warm. The rowels must be continued till the beast be recovered, and if it had none before, one must immediately be made in the dewlap. The beast must be walked out every day, and housed at night with a loose covering.

The following balls may be forced down twice a day, with a drench of two quarts of bran-water, barley-water, or water-gruel, poured down after them.

X.

Take of liquorice-root powdered, flowers of brimstone, and brown sugar-candy powdered, each two ounces; elecampane-root, powdered, one ounce; balsam of turpentine, with anise-seed, half an ounce. Mix these powders all together; then add the balsam. Make these into balls with fresh butter, and cram down half the quantity in the morning, and the remainder in the evening, pouring
down

down any of the abovementioned liquors; or dissolve the ball in the said warm liquor.

These must be continued some days. Should an abscess be formed in the lungs, it may be brought to suppuration and broke, by adding to those balls, saffron, myrrh, turmeric, and yolks of eggs.

After the use of these balls, it will be proper, in a few days, to purge the beast, before it be turned out to grass, with the purging drench N^o. VII. to which may be added, fyryp of buckthorn, if a stronger purge be requisite.

For the scowering, after bleeding, give the purging drench N^o. VII. and afterwards at night the ale drench, with electary of *scor-dium*. Both the purge and drench are to be repeated, till the sharp humour is carried off, and at such distance of time as the strength of the beast may require. Then the tar-water, as beforementioned, with eggs, may be given twice a day: but should the scowering continue, a drench of burnt hartshorn, with a crust of bread and cinnamon, must be forced down. A quart of small ale, with a pint of red wine lees, has proved efficacious in this disorder. Dish-wash, or, which is still better, two quarts of fat mutton-broth should be frequently given. The beast must eat no grass, nor be drove, while the scowering is on. Malt-mashes, with bruised beans, or parched

84 *Of the contagious Distemper*

peas, are good; and after the scowering, to prevent the beast from being hide-bound, the beans or peas may be given with scalded bran.

Rubbing and currying the beast will be of use.

Notwithstanding all imaginable care, the strength of the beast will frequently be so impaired by this disease, that after gradually wasting a month or two the beast dies, especially if the season be unfavourable.

Worms are often found in the stomachs of horned cattle, may produce fevers, and other disorders; but as there doth not appear any symptom, whereby one should imagine worms have the least share in the production of this contagious disease, there can be no reason to administer medicines against them. Moreover, in pestilential fevers and the small-pox, after the *crisis*, in the first discharge of the excrements, worms are frequently observed to be voided dead; and those persons who were troubled with them before, have, by the putrid disease, been totally freed from them: from whence may be inferred, that some degree of putrefaction is adapted by its fermentative heat to the purposes of hatching and nourishing them, while a more exalted degree of putrefaction kills them, and destroys their very nests, which come away like bags of jelly. I never met with any who saw worms voided by the distempered cattle, in this contagious dif-

longer on this subject.

36 *Of the contagious Distemper*

C H A P. VI.

Observations.

A Faithful narration of facts, and repeated experiments, which are the proper vouchers, is the best authority to confirm and establish the method of cure. Without these, all the reasoning is no more than a vain and trifling hypothesis; the practice inconsistent, fallacious, and empirical.

Let the following observations, wherein are fairly related both good and bad success, serve as a test whereby to judge of the efficacy or insufficiency of the method proposed.

A considerable farmer in GODMANCHES-TER, near HUNTINGDON, who, ten years before, had the contagious distemper among his cattle, and then lost seventeen head, was visited again in FEBRUARY last, 1756, by the carelessness of a neighbour, who having a cow dead of this disease, suffered her to lie twelve hours unburied, close to the wall which separated both farm-yards. Ten head of cattle were immediately seized: some were housed, others left to run about the rick-yard. All the stock were instantly bled; milk-pottage was given in plenty. Every one of the first ten died. Two of these, and two more, which died some days after, were the first carcasses I
ever

ever saw opened, and of which some account has been given in the chapter on dissections. Of those who fell ill subsequently to these, I observed that all had not the distemper in the same degree. I shall instance the cases in the order they happened.

A calf was seized with the usual symptoms, and was taken little notice of till the scowering came on, about the fifth day. It was suffered to run about the rick-yard, till being represented to the farmer, that the infectious matter might be lodged about the ricks, and the calf should be sheltered from the cold wind, he had the calf penned up under shelter at night. Vinegar whey alone was given twice a day, the scowering stopt, the boils or pustules, which were very numerous, and began to flatten when the beast scowered, now filled again, ripened, and discharged much fetid purulent matter. The calf chewed the cud, and took its fodder, soon after the crisis, and recovered without giving any trouble.

A black cow, which had been suffered to run about, was, at the time of the crisis, taken with a violent scowering, and lay in the corner of a hovel with its head down to the ground. The cowkeeper gave her up for lost, tho' the symptoms had been all along very favourable. I had not then directed for this cow; but looking on the beast, I saw the nose and mouth were scabbed, the last dung was of a better consistence, and that the beast began to

88 *Of the contagious Distemper*

chew her cud, and prick up her ears. Upon which I desired some dried peas might be offered her: she took a few. A mash of warm malt was the only thing recommended, and to keep her warm. Few boils were to be felt. Contrary to the opinion of the cow-keepers, and to the farmer's great joy, the cow recovered perfectly well. The scowering in this beast was only the critical discharge, and it is plain, that by keeping up her strength, and housing her, nature was supported, while she expelled that way most of the morbid matter.

A white cow, about eight months gone with calf, was seized with all the symptoms of poking and shaking its head, refusal of fodder, running at nose and eyes, stupidity, and groaned much. The state was clear, the dung neither hard nor loose. This cow having been bled when all the stock were, no more blood was drawn, and, indeed, I saw no beast whose urine was so high-coloured, nor heat so great, as to require a second bleeding.

This cow was pegged, and strong digestives were applied to the ulcer; but the discharge therefrom was very small, as was also the running of the eyes and nose. The aperient drench, N^o. II. and vinegar- whey, were regularly poured down. She was constantly rubbed down from the time of housing; but seemed insensible of any relief. She began to scower on the fifth day, and died in few hours.

with-

without slipping calf. Upon opening this cow, the *uterus* seemed chiefly infected, where there were evident signs of gangrene. The rest of the *viscera* were highly inflamed, and disposed to gangrene; but yet were affected in a less degree than was observed in others, the *uterus* being the chief seat of the infection. The calf was dead, but perfect.

A large fine red cow, above eight months gone with calf, was seized at the same time, and rowelled in the dewlap. The discharge from eyes and nose was very great. She was housed and covered in the same stable with the former, but in a stall by herself, and was rubbed down constantly morning and evening; during which rubbing she stood up, as if relieved and invigorated by it. She took the drench, N°. II. regularly, the vinegar-whey, and oatmeal-water. On the third day she threw up above a pint of greenish bile; the rowel swelled to the bigness of a two-penny loaf, and the cowkeeper feared it would come to a gangrene. But, seeing the great flux of putrid matter to that part, I directed only a softening pultice to be applied warm, and frequently renewed, which, encouraging the discharge, emptied the turgid vessels, and decreased the swelling in few hours. The running from this rowel was very considerable the whole time of the illness, and few boils were to be felt. To prevent a scowering and promote the pustules, the drench with Venice treacle was taken at nights, during the stage of maturation. This cow was
one

90 *Of the contagious Distemper*

one of those so fond of the drenches, that she always rose and looked towards the door whenever it opened, and never required any of the drenches to be poured down, but drank up eagerly every drop, licking the pail, to get whatever might stick to the sides. On the seventh day this beast began to chew the cud, the dung being discharged of a proper consistence. About three weeks after she slipt a dead calf, and recovered perfectly well.

In another stable a black cow was placed, who was treated in the same manner with the former: all the symptoms were regular and mild. On the day the *crisis* was expected, she began to chew her cud, and look brisk. The cowkeeper informed me that she had not dunged of four days, and feared she was hide-bound for want of dunging. I told him, that probably the critical time was not yet come; and, upon inquiry when the beast was first seized, I plainly demonstrated to the farmer, and others present, that the seventh day would not begin till the next morning, and desired we should wait till then, to see whether the cow dunged or not: but the cowkeeper's importunities, and my unwillingness to be accused of suffering the cow to be lost, determined me to consent, that the cowkeeper should that night give the cow a mash of warm bran, with a handful of bruised beans in it; hoping this would not relax till the *crisis* had taken place, being of a solid form, and likely
not

not to pass the stomachs till morning. The mash was accordingly made, and the cow had it that evening; but, instead of remaining any time in the stomachs, it passed so quickly like a purge, that in few hours a violent scowering came on, which lasted twelve hours; and notwithstanding all the astringent, sudorific, and opiate drenches poured down, the cow died.

Now this accident convinced me of the ill consequences which must attend purging before the *crisis* be performed*. The whole deposit of the infectious matter was not made in the external parts: nature was disturbed; the matter turned into another channel, by emptying the intestines, and inviting the absorbed matter to run off that way. Thus was the strength of the beast quickly destroyed, and medicines had no power of preserving life.

Supposing, on the other hand, this unlucky mash had not been given, and the cow-keeper's fears had been well grounded, a few hours would have determined whether the beast had dinged or no: it would then have been soon enough to give her a loosening mash, and, in case of heat, or being hide-bound, bleeding and proper diet would have

* *Pistura purgativa, laxativa, et opia.*

Concocta purgare, & movere non cruda.

HIPP. Aphor. sect. i. ver. 22.

92 *Of the contagious Distemper*

removed the complaint, without endangering the life of the beast.

Other beasts in the same farm were attended in the manner abovementioned, and did well, except one calf, whose case is not unworthy relation.

A brisk bull-calf, a year old, was seized with the contagious distemper, as the others had been, and should have taken the drenches; but the apothecary, who sold the ingredients, having at that instant none by him, a neighbour prevailed on the farmer's wife to give this calf some GODFREY'S Cordial; a strong opiate too frequently used, among the poor in this neighbourhood, in the small-pox, for young children in all cases; and, I may say, too often given to grown people, with as little judgment and benefit. However, the good woman's advice was listened to, and the calf had every night a dose of the cordial, and milk-pottage in the day-time. The first four days the calf stood up strong, and would have run about the stable, it was so brisk. The farmer's wife imagined a much shorter and cheaper method was now discovered to cure their cattle, than the one I had advised, and was not pleased at my desiring her to wait the event; assuring her, that if the calf did well, I would gladly embrace this discovery, and communicate it to those I should converse with.

I found

I found out, that this briskness observed in the calf, was only occasioned by the exhilarating power of the *opium*; and, when the effect of this medicine had ceased, that towards evening the calf grew dull. The running at the eyes and nose was inconsiderable; but attended with frequent irritations, that made the beast shake its head strongly. The breathing was difficult at times, the stale high-coloured, no dunging, and a moisture to be felt all over the skin and hair, attended with shiverings and cold.

These were the symptoms, some of which being contrary to those generally attending distempered cattle, encouraged the good women to flatter themselves with success; but how great was their surprize, when, on the fifth day, the calf suddenly died, notwithstanding the regular and constant administration of GODFREY'S Cordial.

Whoever will recollect the effects of *opium*, which, by rarifying the blood, increasing the circulation, exhilarating the spirits, and distending the vessels, of course increases the inflammation in the first stage of this disease, and, if continuing the *pletora*, locks up the malignant humours, rather than promotes a cuticular discharge; must easily account for the effect of the cordial on this calf.

Dr. YOUNG *, in his excellent treatise on *opium*, has clearly stated the times when, in

* Sect. xxxv. and xxxix.

94 *Of the contagious Distemper*

the small-pox, and other diseases analogous thereto, *opiates* may be either beneficial or hurtful. He illustrates, very ingeniously, the great SYDENHAM's practice, and secures his doctrine from the imputations of such as may have miscarried by misunderstanding that sagacious physician's rules. I cannot do better than recommend the perusal of Dr. YOUNG's treatise to every one, who desires to be thoroughly and candidly informed of what relates to the effects of *opium*.

It is evident then, that the blood of this strong young calf was naturally viscid, and must, in this first stage, be rendered more so by the *opiate*; that, far from allowing nature room to assimilate and despumate the blood, by continuing the *plethora*, and the repeated increase of circulation, the serous part of the blood was forced out, the grumous became more glutinous, and the coats of the vessels unable, by their preternatural distension, to contract as usual, yielded to a stagnation that soon clogged up the springs of life.

In the stage of maturation, to forward the discharge of the morbid matter through the pores of the skin, the diuretics, with Venice treacle, were given at night†; but then, in the day-time, vinegar-woley was plentifully poured in, to brace up and preserve the elasticity of the fibres. LANCISI recommends, with the same view, that *alexipharmics* should not be

† See p. 89.

given in this contagious distemper, without acids.

The distemper was communicated from this farmer's yard, near his house, to three cows, all with calf, which were kept in another yard belonging to him, at the other end of the street, without infecting any of the neighbouring cattle between both yards. It was therefore most probably carried by the cowkeeper, or servants, going to and fro, from the infected beasts to those kept separate, or by the dogs which followed them.

The first that fell sick was a red cow, eight months gone with calf. She no sooner began to hang her head down, and poke her neck out, than she was housed, well littered, and rubbed down. She was rowelled in the dew-lap; but did not discharge much by that drain. The running from the nose and eyes was very considerable; but the difficulty of breathing not so great as might have been expected. The medicinal drenches were given very regularly; and on the seventh day, the symptoms having been mild during the whole course of the distemper, the *crisis* was as favourable. About three weeks after, this cow calved a live calf, which was so weak it could not stand. Milk-pottage was instantly poured down its throat with a tea-pot; and, by this nourishment constantly and frequently fed, the calf is grown as strong, and likely to live, as any of the herd, without ever having had, since

96 *Of the contagious Distemper*

since drawing its first breath, the least symptoms of the disease.

A black cow in the same yard was next seized with this contagious disease. She was immediately housed, and rubbed down; but was not rowelled, the cow-leach being out of the way: the medicinal drenches were also omitted, for want of ingredients; so that all the assistance she had was a constant supply of vinegar-whey and hay-water, both warm. The running of the eyes and nose was great, the difficulty of breathing and stupidity considerable at times; however, after four days costiveness, the *crisis* was performed by a gentle discharge of the *faeces* on the seventh day; and having on the ninth day slipt a dead calf, about nine months old, she was recovered by means of malt-mashes, warm ale, &c.

A fine large cow, beautifully speckled with small red spots on a white ground, near nine months gone with calf, was running about the same farm-yard, at the time these two last mentioned cows were ill. I should have been glad this beast could have been moved from thence, fearing, I told the farmer, that from her big state and colour, she would not overcome the disease; but such removal being contrary to the laws, and liable to injure the neighbour's stock, I desired she might be penned up in a corner of the yard, distant from the stables where the other cows were sick,

sick, and out of reach of the morbid *effluvia* arising from them. This direction was neglected, and the cow was found frequently near the doors of the stables; but when she came within the smell of the distemper, would run away hastily; tho' she returned again, whenever she heard the noise of her companions. My prognostic was too soon verified; she was infected in the usual manner. On the appearance of the first symptoms she was housed and rowelled, and rubbed twice a-day. The running from the rowel, nose, and eyes was considerable, the breathing not very difficult. She took the drenches regularly, and was very brisk till the fourth day, that a weariness and dullness came on, succeeded by a stupidity, and frequent lying down. On the fourth day she was seized with a scowering, attended with shiverings and coldness of the limbs. The Venice treacle drench was given at night. In the day-time, vinegar-whey, and a decoction of bark in small ale. This treatment seemed to revive the beast: but on the seventh day the scowering returned, and a mucous discharge from the *vagina* indicated an approaching abortion. The Venice treacle drench was repeated, with one ounce of the compound powder of myrrh, to promote the slipping of the calf; but in few hours the cow died.

She was immediately opened; and no sooner was the skin cut, than a great quantity

98 *Of the contagious Distemper*

of putrid air rushed out, with such an intolerable stench as to oblige every by-stander to seek fresh air to breathe in.

The *membrana adiposa* was quite cleared from any fat in its cells; the flesh appeared, in some places, of a dark red, tending to a mortification; in others, of an intense red, highly inflamed: black clotted blood was found extravasated in the brain, in the ventricles and auricles of the heart, as also in the large blood-vessels. The nose, mouth, organs of respiration, stomachs, and guts, were in a state of ulceration: but the virulence of the disease shewed itself particularly on the *uterus*, or womb, wherein a perfect bull-calf was contained, and turned, as if nature had made a weak effort to expel it. The womb was gangrened, all its vessels greatly distended with grumous blood, and the waters containing the calf were putrid, and stunk much.

From this and the forgoing observations, it appears what little hopes are to be had, whenever any creature in a pregnant state is seized with a putrid disease. Whatever be the manner of its operation and progress, it is evident that the blood-vessels, always increasing their dilatation during the time of gestation, wherein they grow relaxed and less able to contract, are, by a putrid fever, still more distended, weakened, and deprived of their contracting power; so that consequently, wherever the parts have less strength, which commonly are

such as are remote from the heart, and abound with *anastomoses* of blood-vessels, there will be the greatest stagnation of the dissolved blood, and the seat of the mortification.

Not only therefore are creatures, in a pregnant state, carefully to be kept out of the reach of all putrid disorders; but should any unfortunately be seized, the whole intention must be, not to weaken the creature, by too violent or repeated evacuations; to avoid increasing the fever by too hot medicines; and, lastly, so to direct as to preserve the strength of the creature against the attacks of the disease, and especially at the time of abortion, if nature endeavours to expel the *fœtus*.

H 2 C H A P.

C H A P. VII.

Of inoculation.

THIS practice, so providentially discovered, and blessed with all the success that human art can expect, derived from those distant climates whence the small-pox was communicated to us, can no longer be deemed a mean contrivance, nor selfish artifice, calculated only to enrich the faculty, and impose on the credulous vulgar. The preservation of thousands, and even the insignificant number of those that fail, considering the bold attempts of many ignorant persons who practise it, without being able to judge of or remove the least accident, must force the most obstinate sceptics to acknowledge the visible approbation of heaven, and the extensive utility of it to mankind. Would it not be a presumptuous madness, ungratefully to refuse the advantage of such a blessing, confirmed by the recovery of thousands; and obstinately expose our fellow-creatures to most dangerous symptoms of a contagious disease, when, according to all human probability, we may spare them a great part of these dangers? Providence will, in this attempt, as well as in other worldly schemes, frequently baffle the best

best concerted and most rational endeavours, Shall we not allow that power to the supreme Disposer of all, and frowardly blame ourselves? No! it is our duty to submit; and we are by no means culpable, if we acquiesce, after having done our utmost to secure a happy and successful event.

Repeated observations, both in the small-pox and the distemper now treating of, plainly prove, that whatever part is first attacked by those contagious *effluvia*, there generally is the chief seat and impression of the morbid matter, whether the infection be taken into the lungs, or into the alimentary duct. Besides vitiating these organs, the air we breathe is tainted, and the *chyle* carried into the blood is rendered putrid by this matter, both of which must greatly affect the fluids. Now though inoculation is by no means an infallible practice, yet it has this evident advantage attending its performance, that, without suffering the least particle of the matter to enter the lungs or stomach, a sufficient quantity is by the incision conveyed through the small bibulous vessels into the blood. The lungs, unaffected, receive and furnish the blood with pure air, that checks the heat produced by the contagion, and thereby prevents a dangerous inflammation. The stomach and intestines supply the blood with sound *chyle*, which, taken up by the red globules of blood, sheathes them, assists circulation, and prevents

102 *Of the contagious Distemper*

the comminution and dissolution of the blood, too frequently met with in the natural distemper. Moreover, the great afflux of matter to the incisions, which first denote the despumation began in the blood, answers all the good intentions observed in the natural way to attend issues, setons, rowels, or critical abscesses, by carrying off daily a large quantity of the morbid matter, and of the most virulent part, since it is capable of propagating the disease to any other subject inoculated therewith.

Nature also, much less weakened by inoculation than by a contagious disease contracted in the natural way, is by far the better able to perform the several alterations, and produce the *crises* in a more perfect and conspicuous manner. An advantage well known and highly esteemed, by all who are conversant with inoculation. Indeed, this operation should never be undertaken, without a very strict examination whether the subject is fit to receive the infection; and though many have not required much assistance, yet too great a security has endangered life, when help at hand might have prevented the misfortune.

Were it not for the constant intercourse among men; and that society requires to supply the wants of each other; that persons of all ages and both sexes should communicate and go from home, inoculation would not be so universally requisite. Indeed, in such distant places where there is little trade or communi-

munication but with neighbouring villages, inoculation is still unknown; the small-pox and measles rarely visiting the inhabitants, but when brought by a person lately recovered, who, by his breath or clothes, infects the rest. It is not surprising to meet in such places many aged people, who never had the small-pox.

There are also instances of persons, who to an advanced age have lived, and died, tho' frequently attending on the sick, infected with the small-pox, and other contagious distempers, without ever being seized by such infection. No doubt, their juices were not fitted to propagate this disease; and this seems highly probable, by the alteration brought on suddenly, when, through violent exercise or debauch, the fluids are vitiated, then the latent disease breaks forth.

Considering now the short life allotted to the cattle, and that they have the same chances abovementioned of avoiding the contagion, a question naturally arises. Of what use can inoculating the cattle be of? No one will think of bringing the infection into any place free from it, merely for the sake of inoculating their cattle; but if the contagious distemper be in the neighbourhood of a herd, or broke out so as to endanger the stock, by inoculating his cattle, with proper cautions, the grazier or farmer may secure his stock; at least, he will have a better chance by this

104 *Of the contagious Distemper*

operation, since he can house them before they fall sick, prepare them, and have due care taken, knowing the course of the distemper.

* Sir WILLIAM ST. QUINTIN, the rev. Dr. FOUNTAYNE, dean of YORK, and other gentlemen, have succeeded in inoculation. In HOLLAND it has both failed and succeeded. These gentlemen all inoculated with matter taken from the running of the mouth, nose, or eyes. Professor SWENCKE † mentions, that the beast from which he took the matter *was recovering of the distemper*; a circumstance to be attended to. Had matter been taken after the *crisis* from a tumour, boil, pimple, or scab, either on the back near the spine, or on the legs, the *pus* would have proved much more elaborated, subtle, and infecting, than that which flowing with the *mucus* of the nose, must necessarily be, in some shape, sheathed by this glutinous excretion, tho' I am well aware how putrid and acrid it is rendered by the disease.

That nothing may be omitted, which in any shape can contribute to the success of inoculation, due attention should be had with regard to the constitution and state of the beast, no less in this practice on the cattle than on the human species. Undoubtedly the young, healthy, and strong, bid fairer for a

* Gent. Mag. vol. xxiv. p. 549.

† Gent. Mag. vol. xxv. p. 160. Ib. p. 464.

good

good issue than the old, sickly, and feeble: each of these different constitutions demands a particular treatment, even in the method of preparation; and, however trifling it may seem to many, the urging a necessity of preparation, I will venture to affirm, that I have seen the excellent effects arising from a rational preparation; and that, if I have seen fatal events for want of preparation, I likewise have been witness to unfavourable turns, merely from an injudicious preparation.

Whoever chuses to be more satisfied in what concerns inoculation, I shall refer him to the undermentioned authors*.

The beasts which are sanguine, require moderate bleeding; those that have but a small share of blood, must have none drawn. The strong must, besides moderate bleeding and purging, be kept on a light diet, and their bodies kept open: thus scalded bran, with their hay and chaff, will cool them. The weakly, and such as are inclined to scower, must be kept on dry fodder, have peas and

* See Dr. MEAD on the small-pox and measles.

Dr. KIRKPATRICK's analysis of inoculation.

Monsieur DE LA CONDAMINE's letter on inoculation, translated by Dr. MATY.

Mr. BURGESS's letter on the same subject.

Dr. MATY's *Journal Britannique*, vol. xiii. xiv. xv. xvi. xvii. & xviii. In this last vol. see Dr. HERBERT's, and Dr. ARCHER's letters.

Lettres des *Déisteurs* MATY & KIRKPATRICK; vide *Journal Etranger*, par monsieur FREKON, pour le mois de février 1756. And,

Dr. DANIEL COX's letter to a friend on inoculation.

beans

106 *Of the contagious Distemper*

beans given them to strengthen them. A mash of malt, or a quart of ale warm, with a few spices, will suit these best.

There is very little encouragement, if any, to inoculate cows with calves, and very young calves; yet if, through an absolute necessity, on the breaking out of the distemper in the neighbourhood, a farmer or grazier chuses to take the chance, tho' a bad one, he is not to blame; since, if the beast cannot go through the disease when inoculated, it certainly could not when seized unprepared in the natural way. The same will hold good as to young calves.

Whatever diseases the cattle may be affected by, if time will permit, they are first to be removed. Coughs, bloody urine, worms, &c. all are to be cured before inoculation, by the usual means directed in such disorders.

Mercurial and drastic purges are not only unnecessary, as preparatives for the cattle, but may also prove highly detrimental, by weakening them too much, and shaking their nervous system too violently. Their juices commonly require no other alteratives than attenuants, to correct the natural viscosity of their blood. Lenient purges, and mild diaphoretics, will carry off the peccant humours, either by purging or perspiration.

Æthiops mineral and sulphur, * Dr. HUXHAM's *Æthiops antimoniatu*s, or the ingenious

* Philosophical Transactions, vol. xlviii. part. 11.

* Dr. MALCOLM FLEMYNG's balls of *Æthiops mineral*, with crude antimony, burnt hartshorn, and Venice or common *theriaca*, will attenuate and promote perspiration, and may serve both as preparatives and preservatives, if judiciously administered; but let it be remembered, that while these mercurial and antimonial preparations are used, acids of all kinds are to be avoided, even the vinegar-whey, lest, from safe and useful medicines, they be altered, so as to become corrosive and irritating.

Warm mathes of bran, with Glauber's or Epsom salt, lenitive electary, or syrup of buckthorn, will purge gently. Brimstone, only mixed with bran, will promote a gentle perspiration.

The cattle to be inoculated, are first to be well washed, rubbed dry, and then curried, to remove all the filth from the hair and skin; then they are to be placed in a spacious barn or stable, where the air may be temperate, and no cold can come to them. There they are to be prepared, according to the directions already given, foddered with good sweet hay, and watered with clear spring-water; and if the distemper be not near, they may be turned out into the air, near the barn or stable, where they may stay a few hours in the middle of the day.

* Dr. MALCOLM FLEMYNG's proposal to stop the progress of the distemper among the cattle, 1755.

When

108 *Of the contagious Distemper*

When it appears that the cattle are in perfect health, free from any infection, or other disease, brisk and lively, neither costive nor scowering, eating their fodder with a good appetite, and chewing their cud, then the operation may be safely undertaken, and from such time they must be confined in the barn.

Since wherever the infectious matter makes an impression at first, there is observed to follow the greatest flow of the contagious and putrid particles, separated from the blood; particular care must be taken not to inoculate near the vital parts, such as the heart and lungs; nor near the womb, if a cow with calf be inoculated; for though, to draw off the pestilential humour from the breast, rowels are applied, and properly, in the dew-lap, and, in other cases, beasts are frequently rowelled in the flanks; yet in this operation, on the contrary, as matter is inserted by these channels into the neighbouring vessels, those vital parts, or the womb, might become the chief seat of the disease, and the event prove fatal.

To prevent such accidents, the human species have been inoculated on the arms and legs, and now-a-days the arms are found sufficient. I would recommend that the cattle should be inoculated about the middle of the shoulder or buttocks, on both sides, to have the benefit of two drains. The skin is to be cut lengthways two inches, deep enough for the

the blood to start, but not to bleed much. In this incision is to be put a doffil or pledgit of tow, dipped in the matter of a boil full ripe, opened on the back of a young calf recovering from the distemper. It may not be amiss to stitch up the wound, to keep the tow in, and let it remain forty-eight hours: then the stitches are to be cut, the tow taken out, and the wound dressed with yellow *basilicum* ointment, or one made with turpentine and yolk of egg, spread on pledgits of tow. These dressings are to be continued during the whole illness, and till after the recovery of the beast, to promote the discharge, and then may be healed with the cerate of *lapis calaminaris*, or any other.

On the third day after inoculation, the discolouring of the wound, whose lips appear grey and swelled, will be a sign that the inoculation has succeeded; but the beasts, as professor SWENCKE informs us*, do not fall ill till the sixth day, which answers exactly to the observations daily made in the inoculating children. Yet the professor adds, that on the third day a costiveness came on, which was removed by giving each calf three ounces of Epsom salt.

No sooner do the symptoms of heaviness and stupidity appear, than the beasts must have a light covering thrown over them, and at night fastened loosely. They must be

* Gent. Mag. vol. xxv. p. 464.

rubbed

110 *Of the contagious Distemper*

rubbed morning and evening, and curried, till the boils begin to rise. Warm hay-water and vinegar-whey must be given plentifully. Should the beast require more nourishment, dry meat, such as cut hay, with a little bran, may be offered. I should be very cautious in giving milk-pottage, even after the boils and pimples were all come out, for fear of bringing on a scowring: however, this caution is proper, that whenever milk-pottage be given, the vinegar-whey is to be omitted, for obvious reasons.

In cases of accident, the same attention is to be observed in the disease by inoculation as in the natural way, and the medicines recommended are the same I would use; but by inoculation, there seldom is a call for any: so favourable does the distemper proceed thro' its several stages.

The *crisis* being performed, it will be proper to purge the cattle, to air them by degrees, and to have the same regard in the management of them, as is laid down in the chapter on the method of cure.

CHAP.

C H A P. VIII.

Of the means to prevent the infection.

THE means to prevent this dreadful calamity are twofold: first, to prevent the admission of this disease into these kingdoms. Secondly, when unfortunately the contagious distemper is once received, to prevent the spreading and check the progress of it.

I do not call to mind any regulations or orders made by the legislature, relative to the importation of cattle and hides. Since it is almost universally acknowledged, that either by live cattle or raw hides the distemper was communicated to these islands, with due submission, I would propose to the consideration of our rulers, that the same regulations and orders be observed, for the prevention of this ravaging distemper, as are directed to guard us against the communication of the plague. Thus instructions may be sent to our consuls in the several foreign sea-ports, requiring an immediate advice whenever the distemper appears in their neighbourhood; whereupon an order might be issued, absolutely to forbid, under a pecuniary penalty, the importation of any live cattle, raw or other hides, from such infected places. All vessels should be provided

112 *Of the contagious Distemper*

vided with a bill of health, and a certificate of their being free from infection: besides, if required, a quarentaine should be performed. The tide-waiters, or other proper officers of the customs, should be directed carefully to visit all ships coming into our ports from the countries where the distemper rages; and, in case they found any horned cattle or hides on board, instantly to cause them to be thrown overboard, and sunk into the sea, together with horses, hogs, sheep, dogs; in short, such animals as may be liable to convey the infection by their hairy or woolly coverings, and all the litter and hay contained in the hold where they breathed. The place should be purified with steams of hot vinegar, and the fumes of boiling pitch or tar, and the smoak of juniper-berries, frankincense, or tobacco.

Notice should be also publickly given, to prevent any grazier, farmer, butcher, or other person concerned with cattle, from going on board, lest they should bring away the distemper in their clothes. And tho' the sailors dress may be less apt to retain the contagion, because of the tar and pitch sticking about them, and their frequent smoaking tobacco; yet, for the greater security, before they come on shore, their clothes should be washed with warm water and vinegar, and also be smoaked with the fumes of those things just mentioned.

from of blood should be taken. GREAT
habit

GREAT BRITAIN and IRELAND are so well stocked by providence with cattle, to supply all our purposes, that such seasonable prohibition can in no way distress nor detriment any one. The love of what comes from afar, and whose chief excellence is the rarity and dear purchase, cannot, indeed, be gratified at such times; but, certainly, the plenty of various sorts of horned cattle in these kingdoms will allow sufficiently for the mixing of the breed of different counties, and for their several uses intended, without hazarding the total destruction of our cattle, merely to satisfy whim, fancy, or, what is still worse, an illicit gain.

Notwithstanding such precautions be taken with the utmost care and diligence, it may so happen, that private interest prompting a person fraudulently to import distempered cattle or hides, he may succeed in the attempt, and introduce the disease into these islands. Could the offender be discovered, a severe penalty should be immediately levied by the neighbouring justices of the peace, and publick notice given of the breaking out of the distemper, that graziers may avoid driving cattle within three or four miles of the village or pastures where the diseased cattle are. The acts of parliament, and orders of council, to prevent the removal of cattle from the county infected, and the holding fairs or markets, should be strictly put in force. And when-

114 *Of the contagious Dissemper*

ever this prohibition should be taken off, and the cattle allowed to be removed and sold, after keeping them apart forty days; the certificates of health should not be admitted, without the concurring testimony of the officiating minister of the parish, and the parish-officers. This might, in some measure, obviate the too frequent perjuries, which arise much oftner from the ignorance and stupidity of the swearer, than a design of imposing. Then a poor ignorant servant would not call God to witness to the truth of he knows not what; for it has more than once happened, that a country-fellow has come to market with beasts, or hides, asked for a paper, to sell his cattle or hides, at the stationer's; which certificate he has brought to the justice, and taken his oath as to the truth of the contents of this paper, without ever knowing one word of the matter, neither being able to read print nor writing, much less acquainted with the nature of an oath. Indeed, the too common and hasty manner in which oaths are administered, will sufficiently account for the inattention of the vulgar and ignorant, who look upon the clerk's muttering a few words, and kissing the Bible, as more matters of form; and I wish this may not be the case in many other instances.

But to avoid still more the taking false oaths, and also the bad effects of ill-judged good-nature, which might determine some

persons to wave signing the certificate, other-ways than in a vague and loose manner; or perhaps out of a principle of charity, to sign it without much inquiry; inspectors should be appointed, whose attestation should be corroborated by the minister and parish-officers. These inspectors should be persons well acquainted with what concerns the cattle, and have been conversant with the disease; such as farmers, graziers, or butchers. They should be chose and directed by some board, in the same manner as the officers of the excise; be paid a reasonable salary by the government, and sent in such numbers, wherever the disease breaks out, as will be sufficient to do the duty required. Moreover, to prevent all favour or partiality from connections, or influence, like the officers of excise, their quarters should be changed whenever the board thought proper; and no inspector should serve in the county he is a native of, or is settled in.

The office of such inspectors should be at seasonable and regular hours to visit the cattle, either ill of the contagious distemper, or suspected of infection, to see that none be removed to any other place; that the carcasses be buried, as also the litter, dung, &c. and likewise that all the acts of parliament, and orders of council, be duly executed; and in case of failure, to report the transgressor of the laws to the board, who would prosecute such

116 *Of the contagious Distemper*

offender according to the power lodged in them; care being first taken, on the appearance of the disease, to publish in every parish-church the regulations to be observed.

* Dr. WALL has recommended pest-houses or infirmaries for the cattle; and doubtless, on the appearance of this distemper in these kingdoms, it would behove every county to have some huts or hovels erected on a common or heath, at least three miles from the high road, and from any herd; where any cattle brought to sale might be kept some time, and even perform a quarentaine, if the herd came from any infected part. These hovels should be made of such slight materials, though sufficiently thatched to keep the sick cattle warm, that, in case of infection, they might, when no longer of use, be destroyed and buried, without putting the county to too great an expence. Towards defraying this, each herd detained there might pay a small trifle.

But as it would be impracticable sometimes to remove distempered cattle to this heath, without endangering a neighbour's stock by driving the diseased beasts near his, or that the distance would not allow of such removal; some remote pasture, part of a common not used, or heath, in every parish, and the least liable to communication, should be allotted to build small huts or hovels, which would hold

* Gent. Magaz. vol. xxi. p. 72 and 126.

not above three beasts at most, and in which only two sick ones should be put.

Immediately on the first seizure of a beast, it should be gently drove to this pest-hovel, and all such that, of the same herd, should fall afterwards in the like manner; for were the beast to remain among the herd till the time of suppuration come on, it will then be too late, the beast will be endangered thereby, and the herd, in all probability, totally infected. Servants must be appointed to the sole care of these separated cattle, and should have a frock, linnen-cap to cover all their hair, and oil-skin spatterdashes, while they attend these hovels; which dress is to be, together with the hovels, &c. either buried, or not brought home until well smoaked with brimstone and tobacco, after a thorough washing with soap-suds first, and then vinegar. Was this dress to be left at some convenient place in the mid-way, there would be less chance of carrying the infection than dressing and undressing nearer the sick cattle, or home; and it cannot be expected, unless in case of violent illness, that the servants should all constantly attend day and night.

* Dr. MEAD prefers the burying all goods used, or clothes wore, which have been infected, preferably to burning them, lest the infectious particles should be dispersed by the

* On the plague, p. 120.

118 *Of the contagious Distemper*

smoak, and thereby the infection conveyed; two instances of which the doctor relates. The first quoted from * MERCURIALIS, who says, " the plague at VENICE was increased " by burning infected goods. The second " instance is, a poor man dying of the small- " pox at SHIPSTON in WORCESTERSHIRE, " whose clothes, and the house he had been " removed to, on a hill a small distance from " the town, were ordered to be burnt; and " the smoak being drove by the wind upon " the houses on one side of the town, in a " few days eight persons fell ill of the small- " pox. So dangerous, adds the learned doc- " tor, is heat in all kinds of pestilential dis- " tempers, and so diffusive of contagion." The burying therefore of the huts or hovels, with the thatch, litter, and the clothes wore by the attendants, will prove a safer method than burning, provided they are buried of a sufficient depth.

Thus far these directions point out the means of preventing the distemper from being brought into these kingdoms, or into any particular district: how to preserve the cattle from an approaching disease broke out in the neighbourhood, how to stop its progress in a herd, and how to guard against communicating the infection to the neighbour's stock, are next to be considered.

* De pestilent. cap. xxi.

The instant it is known the contagious distemper is broke out in a village, pasture, or neighbouring town, all farmers and graziers should be careful to remove their stock * as far distant from the infected place as possible; but should the wind blow from that side towards the pastures the sound cattle are designed to be put in, it will be most proper either to drive them some other way out of the course of the wind, or shelter them under cover in barns, stables, or hovels, where they may be detained till the wind has shifted.

But supposing the air of the village be tainted so, that there be little probability of the cattle escaping the distemper, notwithstanding the above precaution; and that the farmer will not venture on inoculation, but will take his chance of the stock receiving the distemper in a natural way; then such steps are to be taken which are the most likely to procure a favourable illness, if it cannot be avoided.

Nothing conveys the distemper quicker, than the putrid steams brought by the servants clothes, who, led by curiosity alone, go to visit the infected cattle. They should therefore be strictly forbid going near such beasts, or even conversing with those who look after them. Besides, they should be directed to drive the cattle so gently, that they be not heated by over-driving. The cattle should be

120 *Of the contagious Dislemper*

constantly watered twice a-day, their skin and hair kept clean by rubbing and washing.

Bleeding and purging the cattle, so far from proving of use, has not prevented the disease; but, rather, the symptoms have been more violent in some who were blooded and purged.

Tar-water has been given as a preservative, and is said both to have succeeded and failed. Its heating and glutinous quality, I should apprehend, would rather increase the viscosity of the blood; consequently render the disease still more dangerous.

Mr. WILLIAMS, a gentleman of great merit and veracity, who many years practised surgery and pharmacy with deserved and just applause in this county, communicated to me a receipt, which had been used as a preservative; but ingenuously owned, that it had frequently been unsuccessful. The prescription is a decoction of madder and turmeric-roots, fenugreek-seeds, feverfew, moth-mullein, sage, and rue, boiled in ale; and to the strained liquor add two ounces of (*ostracites*) kate-shells, clean washed, calcined, and powdered fine. This to be given for a dose. The ingredients for the decoction are well adapted, and most of them were made use of in the cure of infected cattle. But the *ostracites*, directed with a view to absorb and correct the acidity supposed to irritate the first passages, and raise this fever, occasioned the medicine to fail in several subjects, on account of its clogging

clogging quality. And besides, the *ostracites*, though abounding more with marine salt than several fossil bodies, and much less than the oyster-shells, is no sooner calcined than it becomes almost as great a *septic* as chalk, or prepared *testacea*; therefore this preparative will prove useless in *some* constitutions, since the blood must necessarily thereby be disposed to stagnation and putrefaction, before the putrid contagion seizes the beast. Mr. WILLIAMS was so well convinced of this effect from the *ostracites*, that he ordered the farmers not to give it during the fever.

* Dr. HUXHAM's *Æthiops antimoniat*, and † Dr. MALCOLM FLEMYNG's bolus of *Æthiops* and *antimony*, are the best mineral preparatives and preservatives I know of, most likely to break the viscosity of the blood, and promote perspiration.

These excellent chymical preparations, so well calculated for the purpose in hand, are not by any means to be given to an infected beast. The doses, when proper to be given, are to be formed according to the age, strength, and constitution of the beast; and as it is absolutely impossible these medicines should be prepared at home by the most in-

* HUXHAM's essay on antimony, or Philosoph. Transf. vol. xlviii. part. ii.

† FLEMYNG's proposals to stop the progress of the distemper among the horned cattle, or Universal Magazine for Oct. 1755.

122 *Of the contagious Distemper*

telligent farmer or grazier, I refer them to their apothecary, who doubtless will humanely direct his neighbours, as to the proper time of administering such medicines, the dose and form they are to be given in, according to the directions laid down by the abovenamed authors in their several tracts.

* LANCISI has recorded some forms of medicines, which "were beneficial before the contagion seized the beasts, but proved unsuccessful during the illness. He says "he has placed them in his book, that they "may be of use whenever the disease shall "appear milder."

I shall translate some few of these ITALIAN prescriptions, that seem the best adapted for the choice of my countrymen.

A remedy to preserve the horned cattle.

Take half an ounce of brimstone, half an ounce of brown sugar, a little common oil, a little salt; and make up the whole into a solid form, with strong vinegar, or into a mixture, putting also some juniper-berries bruised, and a white onion sliced very thin, so as to have a porringer full of this

* Formula remedium quæ utilia quidem deprehensa sunt priusquam morbus pestilens evasisset, postea vero irrita fuerunt. Hic autem afferuntur, ut si quando benignior aggrando recideret, usui esse possint. LANCISI de bovillâ peste, part. ii.

com-

composition, which will be sufficient for one beast; and then, after this medicine, another porringer full of pure vinegar is to be given to drink down immediately.

Rimedio per preservare gl' animali boyini.

Si piglierà zolfo mezz' oncia, zaccbero rosso mezz' oncia, un poco d'olio commune, un poco di sale, ed il tutto si comporra, ò mescolera con aceto forte, ponendovi entro anche bacche di ginepro ammaccate, e cipolla bianca sottilmente tagliata in modo, che formi una scodella di composizione, quale servira per un animale solo: e poi dopo questo medicamento se gli darà subito a bere dietro un' altra scodella d'aceto puro.

Another remedy, used when the disease was more violent.

Take as much vinegar and water as an ox will drink at one draught, flower of brimstone, common oil, garlick, Venice treacle, salt, juniper-berries, and barley-meal, and boil them all up together: when it is cold, give it to a sick beast to drink.

Altri remedi praticati ne' mali più acuti.

Si piglierà aceto, & acqua quanto basti per farne la bevanda ad un bue. Fior di zolfo, olio com-

124 *Of the contagious Distemper*

commune, aglio, triaca, sale, bacche di ginepro, e farina d'orzo, il tutto si fa bollire insieme, e raffreddato si dà al bue inferma in bevanda.

Another drink.

Take one ounce of flower of brimstone, three ounces of brown sugar, four heads of garlic; wine, and vinegar, each a pint, and mix all these together: it will make a drink for an ox.

Altra bevanda.

Si piglià fior di zolfo un' oncia, zaccbero rosso oncie tre, aglio capi quattro, vino, ed aceto mezzo boccale, il tutto si mescola insieme, e serve per la bevanda d'un bue.

A perfume or fumigation to preserve the stables from infection, whether the cattle be sound or ill.

Frankincense and juniper-berries, of each equal parts; and two heads of garlic,

Profumi de farfi per preservativo nelle stalle delle bestie sane, o inferme.

Incense e bacche di ginepro, parti eguali, e due capi d'aglio.

Another perfume.

Of fennel-seeds and juniper-berries, each six ounces; of frankincense, three ounces. The above perfumes are to be burned slowly, keeping the stable shut very close.

Altro profume.

Semi de finnochio nostrale, bacche di ginepro oncie sei per sorte, incenso oncie tre. La sudetti profumi si fanno abbruciare lentamente, tenendo ben chiuse le stalle. LANCISI loco citato.

These prescriptions may point out the end proposed, and furnish hints for using such other officinal medicines as will answer the like intentions of breaking the viscidty of the blood, promoting perspiration, and expelling, by very active and volatile fumes, foul air, impregnated with the pestilential *miasmata*. The ancient writers on agriculture, recommended the same medicines which LANCISI speaks of. CATO orders, as preservatives from infection, salt, bay-leaves, leeks, garlic, frankincense, savin, rue, white vine-stalks, all bruised, and given mixed in wine*.

COLU-

* *Bubus si morbum metues, fanis dato salis micas iij, laureæ foliæ iij, porri fibras iij, ulpici spicas iij, allii spicas iij, thuris grana iij, herbæ sabinæ plantas iij, rutæ folia iij, vitis albæ caules iij, vini sextarios iij. Hæc omnia sublimiter legi, teri darique oportet. Jejunos sit qui dabit.*

Ter

126 *Of the contagious Distemper*

COLUMELLA also mentions the giving fennel-seeds, myrrh, frankincense, and the blood of a tortoise, mixed with old wine: I observe not as a preservative alone, but even in pestilential diseases.

Possibly the distance from an apothecary may be so great, and the distemper brought so near a head, that the owner would be desirous of having some sort of medicine directed for his cattle, which might be administered until those remedies already mentioned could be procured. For this purpose, I would recommend the following, which, being composed of ingredients efficacious during the infection, bid fair, especially mixed with warm discutients and aperients, to remove obstructions and repel infection.

XI.

Take two heads of garlick, bruised; of fennel-seeds bruised, flower of brimstone, and brown sugar, each half an ounce. Mix these up with a sufficient quantity of Barley-meal and ale; then make the whole up into a soft ball, which is to be given every morning fasting, with the following drench after it.

Ter tidiu[m] de ea potione unicuique bovi dato. In divisione cum ter unicuique dederis, omnem absumas. Postque ipsas si qui dabis facito ut uterque sublimior sit, vase ligneo dato.

CAVO de re medica, titul. lxxi.

COLUMELLA, lib. vi. cap. v.

XII.

XII.

Take sage and rue-leaves, of each two handfuls; chamæmile-flowers, one handful; grafs-roots, and horse-radish-roots, of each one ounce; juniper-berries bruised, half an ounce. Boil these in three pints of vinegar-whey, till it decreases to one quart; which strain, and give lukewarm.

If any beast, of a weak constitution, should require a more strengthening medicine, ale may be used instead of the vinegar-whey, and Venice-treacle may be added to the ball. Dry fodder, clear spring-water, and moderate exercise, are strictly to be used, and the effects of cold carefully avoided.

All authors agree with regard to the benefit arising from setons and issues, in case of an approaching contagion; it would be needless, therefore, to quote them. Since nature, accustomed to an outlet, will certainly discharge, through that opening, whatever humour is obnoxious, can there be the least hesitation whether the cattle should be rowelled or not? If they escape the infection by means of the medicines just described, or any other means, a rowel or two may have given vent to any bad humours, and cannot have done them any harm; but should all precautions have failed, and the cattle thus rowelled should receive the infection, then this considerable advantage will

128 *Of the contagious Distemper*

will of course follow, that the virulence of the distemper shall flow to those parts, and be discharged through these outlets. Besides, as rowels made at this time are to be placed in the shoulders or buttocks, for the same reasons as they are directed to be made in those parts for inoculation, the vital organs will be less liable to suffer by an overload of putrid matter, which the rowels carry off at some distance.

Yet these preservative medicines may fail: the smoak of tobacco, or the perfumes, may not keep off the infection, if conveyed by an infected beast brought into the herd, or by the herdsman or cowkeeper's clothes. In the first case, the beast, lately brought into the stock, and, perchance, because it has just recovered from the disease, is to be instantly removed from the herd, and put in a pasture apart, where it cannot infect any more: such as have received the infection from this beast, are immediately to be separated from the rest, and treated according to the method of cure already laid down. Likewise cattle, receiving the infection from the pestilential matter

† pestilentia quæ cum in gregem incidit, confestim mutandus est cœli status & in plures partes distributo pectore longinquæ regiones petendæ sunt, atque ita segregandi a sanis morbidî, ne quis interveniat qui contagionem cæteris labefaciat. Itaque cum ablegabuntur in ea loca perducendi sunt quibus nullum impascitur pecus, ne adventu suo etiam illis tabem afferant.

COLUMELLA, lib. vi. cap. v.

brought

brought in their keeper's clothes, are to be separated on the first symptoms of the disease breaking out upon them. Should they recover, they must not be drove among the sound ones who never had the distemper; nor in such pastures or places where, rubbing against the hovels, rails, or fences, they may break the pustules, or rub off the scabs, so as to leave some of the matter sticking on wood, straw, hay, or any substance whatever, which may retain it, and communicate it to fresh cattle that come after.

The carcasses of such beasts as die of this contagious distemper, are directed, by an order of council of the 17th of October, 1747, to be buried within three hours after death. Time should be allowed for the carcass to cool, and the humours to stagnate, lest the pestilential *effluvia* should fly off in so great a quantity as to taint the air the carcass is to pass through. When cold, the carcass is with all convenient speed to be carried out to the pit; but not drawn on the ground, lest a sharp stone, or any cutting thing, should open the abscesses or pustules, whereby the contagious matter might be let out. To prevent the like bad consequences, I must publicly disapprove of cutting and slashing the hides, to render them unfit for use, and likewise still more of dismembring the carcasses to bury them with greater ease. Such incisions, and taking off the limbs, only serve to give vent

130 *Of the contagious Distemper*

to all that putrid air observed puffing up the skin in the last stage of the illness. Let the carcass then, whole and covered, be conveyed to the pit, which should be dug at least eight if not ten feet deep *, and wide enough to receive the carcass, laying on its side: sharp flints may be next thrown in, over which some mould, and then a layer of clay about two feet thick, which is to be well rammed down, to close the mould to the carcass, and force the flints into the hide: the clay will prevent the putrid steams from issuing out; then the remainder of the earth is to be put over carefully, ramming it down hard several times. Some loose mould should be left at about half a foot's depth from the surface, to receive the seeds of grass, or any aromatic herbs proper to be sowed therein, according to † FORESTUS; who relates, that, after the plague at DELFT in HOLLAND, the physicians advised the throwing a large quantity of earth over the graves, and the sowing grass and several other seeds, that, as they grew up, they might close up all the small openings, and prevent the eruption of the pestiferous matter. ‡ LAN- CISI adds a very proper direction, that the

* Usque eo etiam mortua cadavera ultra fines villæ pro- jicienda sunt, & altissimè obruenda sunt sub terris: ne forte ipsorum corporum interna sanorum contingantur & pe- reant. VEGETIUS in Art. Veterinar. lib. iiii. cap. 11.

† FOREST. lib. vi. obs. 25. in scholio.

‡ De Equorum Epidemia.

earth should be heaped up over the pits, lest, when the carcass decays, and the earth subsides, there should be a hollow where the rain might settle, gull, and loosen the mould, which then would yield a passage to the putrid *effluvia*. And here I must caution our farmers against a practice too frequently met with among them; I suppose, only with a view of convenience to their servants, the place being near at hand, or to avoid breaking up any grass-ground; I mean the burying the carcasses of infected cattle in their rick-yards. The consequence has been, more than once, that these carcasses being buried not above three or four feet deep, and sometimes but two, have rotted, and emitted such a stench, that it has drawn the dogs and hogs to these pits, who have immediately scratched or grubbed up the putrid flesh, which they eat; letting at the same time the poisonous exhalations fly out, which, fixing in the hair of these creatures, and partly to the ricks in the yard, have spread the infection all over the neighbourhood where the dogs or hogs went, and tainted whatever fresh stock was turned into the rick-yard.

The hay, straw, or litter, the infected beasts have breathed on, are not only to be removed and buried, but the stables, hovels, or barns should be cleaned thoroughly; all filth and dung put under ground; likewise milk drawn from the sick cows, or blood, if any, should

132 *Of the contagious Distemper*

be taken away. After the distemper is over, stables, cribs, mangers, racks, are all to be washed, first with hot soap-suds, and afterwards with vinegar and water. The walls of plaster, or clay, are to be first scraped; then a fresh coat of plaster or clay laid on, and, when dry, the walls are to be washed with lime-water. Wet gunpowder, pitch, tar, brimstone, tobacco, frankincense, juniper and bay-berries, or the perfumes already mentioned, should be burnt, and the sinoak confined in these stables, more than once. Besides, no beast should be put into these stables, barns, or hovels, within two or three months after they have been cleared from the infection.

The cattle, recovered from the distemper, should be detained a few days after recovery in convenient barns or stables, that they may be thoroughly rubbed, curried, washed with vinegar and water, and perfumed two or three times, to destroy the pestilential *effluvia* as much as possible, before they are turned out into the pastures, and to prevent their infecting other beasts.

Killing the cattle, on the first appearance of the symptoms, has been advised and ordered; but many beasts having been hastily killed, who probably were never infected, and to the imposition of many persons for the sake of the bounty, as also lest the destroying such numbers should produce a scarcity of cattle, that order

order has not been strictly enforced, and the people have been allowed to try if their cattle could be saved by medicines. Notwithstanding the rigour of the edicts issued by pope CLEMENT XI, on account of this distemper, his physician * LANCISI advises his countrymen not to omit trying some method of cure, if it be possible for medicines to remove the disease.

Thus have I laid down the several methods which seemed to me the most likely to prevent this fatal calamity from visiting our herds, and have been found beneficial in different countries. There remains only one more to be recommended, which, being a rational duty, has been universally received by all people of whatever nation or religion, according as they were enlightened. The Heathens made sacrifices, and oblations to their gods, that they might appease their wrath and avert the disease. The Christians have called upon their Creator in such times of visitation, according to the rites and ceremonies of the church they belonged to. Our prelates have drawn up a form of prayer to be used all over these kingdoms at the time of such distress, to implore the Divine Assistance and Protection.---A method on all accounts expedient, towards the

* LANCISI, part. iii. cap. xi.

134 *Of the contagious Distemper, &c.*

success of our own endeavours; since we cannot reasonably expect a good event in the use and application of *second* causes, 'till we have secured the concurrent favour of HIM whom we justly acknowledge to be the *first*.

F I N I S.



ERRATA.

Page 6, in Note, line 3 from the bottom, for *februm* r. *februm*.

Page 8, Note, line 7 from bottom, for *in* r. *ni*.

Page 40, line 22, the semicolon (;) not after *rumen*, but after *ancients*.

Page 48, Note, line 2 from bottom, for *Malle* r. *Mellier*.

ERRATA

Page 1. Line 1. "The" should be "The".
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A
DISCOURSE

ON THE

Usefulness of INOCULATION of the
Horned Cattle to prevent the contagious distemper among them.

In a Letter to the late Right Honourable
GEORGE Earl of MACCLESFIELD, P.R.S.
from DANIEL PETER LAYARD, M.D. &c.

*Read before the Royal Society February 2,
1758, and printed in the 50th Volume of
the Philosophical Transactions.*

MY LORD,

THE honour you have done me in
condescending to peruse my Essay on
the contagious distemper among the horned
cattle claims my most respectful thanks:
and I am no less obliged to your Lordship
for the just remark you made, "That before
" inoculation could be practised on the
" horned cattle, it is necessary to bring
" proofs that this disease is not susceptible
" more than once; and also assurances that
" a recovery from the distemper by inocu-
" lation guards the beast from a second in-
" fection."

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An entire conviction of the analogy between this disease, and the small-pox, would not permit me to omit mentioning the great advantages which must arise from inoculation, and therefore, my Lord, I recommend its use; nor do I find any reason to alter my opinion, after having carefully read over what has been published, and made the strictest enquiry I was able in several parts of Great-Britain. I shall in the concise manner possible, submit the following particulars to your Lordship's consideration, and the learned society over which you so deservedly preside.

The Marquis de COURTIVRON in two memoirs read before the royal academy of sciences in the year 1748, and published by that learned body, relates the observations he, together with M. PELVERSIER DE GOMBEAU, formerly surgeon to the regiment de la Sarre, made on the rise, progress, and fatality of the contagious distemper at Issurtille a town in Burgundy: to which are added experiments they made, by application, digestion, and inoculation, towards communicating the disease, and concludes from the failure of these attempts, that the distemper can only be communicated from one beast to another. Besides notwithstanding the Marquis observes*, the

* Memoires de l'academie de sciences anno 1748. p. 326.

regularity of the illness, the critical days on the seventh, and ninth; and particularly that all such as recovered had more or fewer pustules broke out in several parts of the body; yet * he will not allow of RAMAZZINI's opinion of the analogy between this distemper and the small-pox, nor that it is an eruptive fever, but ranks it as a plague.

But the Marquis goes still farther. He positively says, † “ That in the preceding years in the provinces of Bresse, Maçonnois and Bugey, some private persons had suffered, by buying cattle recovered from the distemper, which had, at that time, the pustules remaining on them, and which cattle had the distemper afterwards.” Nay he adds, “ that even after recovering twice, a third infection has seized and killed many.”

No wonder, my Lord, that such positive assertions should stagger and cause the practice of inoculation not to be received, till the nature of the disease be absolutely determined, and facts prove the contrary of what has been asserted.

In a matter of so great importance to every nation, it were to be wished, that the Marquis DE COURTIVRON had produced attested observations of these second and third infections; for though a nobleman

* Ibid. p. 338. † Ibid. p. 337.

of his rank and character, and great abilities, would not willingly impose upon the world, yet it may happen that he may have received wrong informations.

As to the nature, rise, progress, and fatality of the distemper at Murtille, it appears to be the same disease that raged in these kingdoms, all the symptoms agree, as described by RAMAZZINI, LANCI, the Marquis, and in my Essay. A distempered beast gave rise to the three infections. The illness was every where the same in Italy, France, and Britain; and either terminated fatally on the fourth, or fifth day, when a scowering prevented the salutary eruptions, or in some cases by abortion; and on the seventh, or ninth, favourably, when the pustules had regularly taken their course. Tho' the Marquis did not observe that any particular medicines were of use, he says that in general acids were beneficial, especially poor thin wines somewhat sour, and that the distempered beasts were all fond of these acids*.

The fatality was likewise the same, as will appear from the Marquis's tables, of 192 head of cattle 176 died. The mortality was chiefly among the fat cattle, cows with calf, and young suckling, or yearling calves; and of the surviving 16, only 2

* See my Essay on the contagious distemper, pag. 70.

Usefulness of Inoculation. 139

calves out of 77 lived, and these 2 with 7 other beasts of the 16 escaped the infection, tho' constantly among the diseased, so that it is plain,

Of 192 beasts 176 died,

7 recovered,

9 escaped the infection.

192

The mortality was as considerable in these kingdoms.

Whoever will compare the appearance, progress, and fatality of the small-pox, with what is remarked by writers of authority, RAMAZZINI, LANCIUS, and other observers, relative to the contagious distemper among the horned cattle, will not be at a loss one moment to determine, whether this disease be an eruptive fever, like unto the small-pox, or not.

Now if, as the Marquis had granted in both his memoirs *, it be a general observation, that an eruption of pustules on some parts of the body regularly thrown out, digested and dried, is the means used by nature to effect the cure, and that in general the morbid matter doth not affect the parotid, inguinal, or other glands, nor produce large carbuncles, and abscesses, as the plague doth; nay more, since it is observed by

* Pag. 143, and 338.

the Marquis, that the difference between the contagious distemper of 1745 and 1746, and of 1747 and 1748, was, that in the former the salutary eruptions appeared, but in the latter, were, as he justly apprehends, checked by the excessive cold weather; and should it appear, that by inoculation the same regular eruptive fever has been produced, with every stage, and the same symptoms as arise in the small-pox, the nature of this distemper will then be ascertained.

I shall now, my Lord, proceed to lay before your Lordship, and the Society, the accounts I have received relating to the infection, and inoculation of the cattle, and make some observations on the experiments made at Isfurtille.

So long, my Lord, as the distemper has raged in Great-Britain, not one attested proof has been brought of any beast having this disease regularly more than once. I make no doubt, but these creatures may be liable to eruptions of different kinds. But as all sorts of eruptions, says Dr. MEAD *, are not the small-pox, or measles, so every pustule is not a sign of the plague. Through ignorance, or fraud, persons may have been deceived, in purchasing cattle, and have lost them, as well in England, as in the provinces of France, mentioned by the Marquis, but until a second infection

* Essay on the Plague.

Usefulness of Inoculation. 141

be proved, the general opinion must prevail in this case as in the small-pox; for though many have insisted on the same thing with regard to the small-pox, yet a single instance properly vouched and attested, has never been produced; either after recovery from the natural way, or from inoculation, unless what is frequently the case with nurses, and others attending the small-pox, that is, pustules breaking out on their arms and face being allowed as the signs of a second infection.

The farmers and graziers in Huntingdonshire, Cambridgeshire, Lincolnshire, Kent, and Yorkshire, from whence I have written testimonies, all agree, that they never knew of a beast having the contagious distemper more than once. In this county particularly, Mr. J. MEHEW the farmer mentioned in my Essay, has now among his stock at Godmanchester eight cows, which had the contagious distemper the first time it appeared in Godmanchester in 1746. It returned in 1749, 1755, and 1756. The two last not so generally over the town as the two former years; all these four times Mr. MEHEW suffered by the loss of his cattle, yet those eight cows which recovered in 1746, remained all the while the distemper was in the farm the three years it raged, were in the midst of the sick cattle, lay with them in the same barns,

eat of the same fodder, nay of such as the distempered beasts had left and flabbered upon, drank after them, and constantly received their breath and steams without ever being in the least affected. Is not this a convincing proof? If in general the cattle be susceptible of a second infection, how comes it that not one of these eight cows was affected?

In the years above-mentioned the distemper spared no beast but such as had recovered from that disease, and this is confirmed to me by Mr. MENZIE's father and brother, all the chief farmers of Godmanchester, and is the opinion of all the farmers and graziers in Huntingdonshire, who are so thoroughly convinced of there being no second infection, that they are always ready to give an advanced price for such cattle as have recovered from the contagious distemper.

The Rev. Mr. SCAIFE, assistant to the Rev. Dr. GREENE Dean of Salisbury, in his parish of Cottenham, Cambridgeshire, acquaints me, that the farmers in that neighbourhood lost in 1746 and 1747, twelve hundred head of cattle. In 1751 four hundred and seventy, and tells me that Mess. IVETT, SAYER, MOOR, DENT, LAWSON, chief farmers at Cottenham, Mess. TAYLOR, SUMPTER and MATTHEWS of his own parish of Histon, and the farmers of Wivel-
lingham,

Usefulness of Inoculation. 143

ingham, alias Willingham, unanimously declare, that they never had one instance of a beast having the distemper twice.

Mr. THORPE, a farmer and grazier near Gainsborough in Lincolnshire, has had beasts recovered from the distemper, which have herded with cattle fallen ill afterwards, and never met with a single instance of a second infection.

Mr. LOFTIE, an eminent surgeon at Canterbury, has enquired for me of the farmers and graziers in that part of Kent, and about Romney Marsh, and from whence no belief of a second infection can be had.

The Rev. Dr. FOUNTAYNE Dean of York writes me word, that no beast has been known in his neighbourhood to have had the distemper twice, and several persons from that country, and others have told me, the same thing.

If the above testimony of persons of character and veracity, together with the concurrent persuasion of farmers in general be allowed of, it must be determined, that there is no instance of a second infection; supposing now it should appear that this distemper is regularly as in the natural way, tho' in a milder manner, produced by inoculation, and that inoculation secures a beast also from a second infection, then undoubtedly inoculation will be recommendable. The very few trials made in England, and those made,

made, not with the greatest exactness, or propriety, will yet serve to put this matter out of all doubt.

The Rev. Dean of YORK had five beasts inoculated by means of a skain of cotton dipped in the matter, and passed through a hole like a seton in the dew-lap. Of these five, one cow near the time of calving died, the other four, after going through the several stages of this contagious disease, recovered. Two of which being cows young with calf did not slip their calves. All four have herded with distempered cattle a long while, and never had the least symptom of a second infection.

Mr. BEWLEY, a surgeon of reputation in Lincolnshire, inoculated three breasts two years old, for Mr. WIGGLESWORTH of Manton in the dew-lap, and with mucus from the nostrils, all three had the regular symptoms of the contagious distemper in a mild manner, recovered, and though they herded a twelvemonth after with five or six distempered beasts, they never were the least affected. Mr. BEWLEY also declared to Mr. THORPE that there never was one instance produced that he knew of, of a second infection.

Since it is plain, that notwithstanding neither well digested pus was made use of, nor incisions made in the properest place; and it may be supposed few medicines were given,

Usefulness of Inoculation. 145

given, yet inoculation succeeded so as to bring on the distemper in a regular and mild manner, as it appears by the cows with calf not slipping their calves, one may fairly conclude, that in this contagious distemper like unto the small-pox, the practice of inoculation is not only warrantable, but much to be recommended.

But how comes it then that neither by application, digestion, or inoculation, the distemper was not communicated in France?

The Marquis says, that this distemper is not communicated but from one beast to another immediately. I must beg leave to say that to my knowledge, the distemper in February 1756 was carried from the farm-yard, where I visited some distempered cattle from two other farm-yards, each at a considerable distance, without any communication of the cattle with each other, and merely by the means of servants going to and fro, or of dogs.

The experiments made of four beasts by tying over their heads part of distempered hides, or pieces of linen, and woollen cloth or silk, which had received the breath, or steams of dying cattle, served to shew, by the bullock's forcing off the cloth tied about him, that the putrid stench was disagreeable to him, but that neither his blood, or that of the other three beasts was then in a state to receive the infection.

With

With regard to the pustules which the Marquis relates, were mixed with oats, and bean, or dissolved in white wine; the distempered bile which was mixed with milk; milk taken from diseased cows; water in which part of a distempered hide had been steeped; and the precaution taken to force these mixtures into the paunch of calves by means of a funnel, whose end was covered with a piece of raw distempered skin, that the beast might both swallow and suck in the disease: All these experiments could have no other effect than what follow'd, which was, that the acrimony of the distempered bile, caused first a nausea, and then produced a violent scouring which killed the beast, leaving marks of its irritation on the intestines.

The practice of inoculation is but lately followed, and even now but little known, in the provinces of France. Its advantages have not long since been strangely disputed at Paris. In the case of inoculating cattle instead of a slip of raw hide taken from a beast just dead, or putting a pustule into the neck, they should either have passed in the dew-lap cotton or silk dipped in well digested *pus*; or have inserted in proper incisions cotton, thread, or silk soaked with *pus*, either on the shoulders, or buttocks, the true way of inoculating in the English manner. Some persons have indeed thought, that

Usefulness of Inoculation. 147

that to inoculate with the blood of the infected would answer the intention, but most of the modern practitioners chuse to depend on digested matter.

Several constitutions will not receive infection, let them be inoculated ever so judiciously. A RANBY, a HAWKINS, a MIDDLETON, and other inoculators will tell us, that the incisions have sometimes suppurated so much, that pustules have appeared only round the edges of the wound; without any other particular marks of the disease, and yet the patient has never had the small-pox afterwards. The Marquis mentions an instance somewhat of the same kind in his first memoire, p. 147.

The examination of these very important, and interesting particulars, has, I observe, drawn me into a prolixity, which I fear may prove tedious to your Lordship: But should I have removed all doubts, and brought convincing proofs of the absurdity of fearing a second infection: Should I have shewn inoculation to be a necessary practice, and that the contagious distemper may be communicated, more ways than one, I hope your Lordship will excuse the length of this letter. I shall only add my earnest wishes that the legislature may by effectual means prevent the importation of distempered cattle and hides into these kingdoms. The only means of naturalizing,

ing, and perpetuating a dreadful distemper,
now thank God, much decreased among
us.

I am, with the greatest respect,

My Lord,

Your Lordship's

most humble, and most

obedient servant,

Huntingdon,
Nov. 26, 1757.



D. P. LAYARD,

